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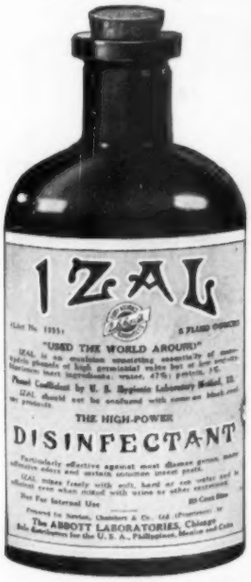


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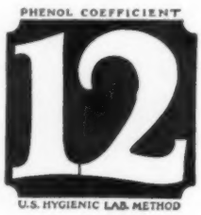


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# HYGEIA

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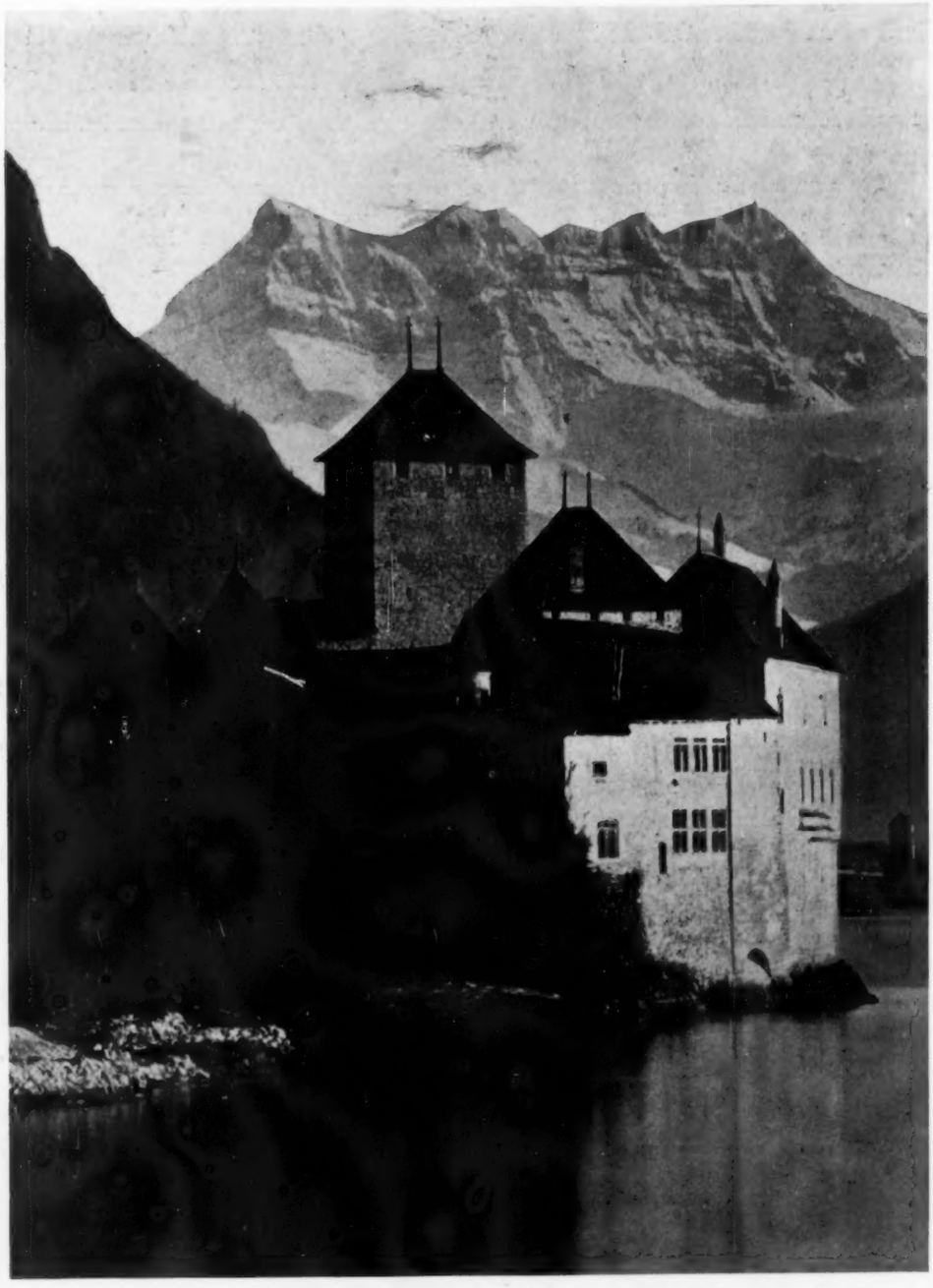
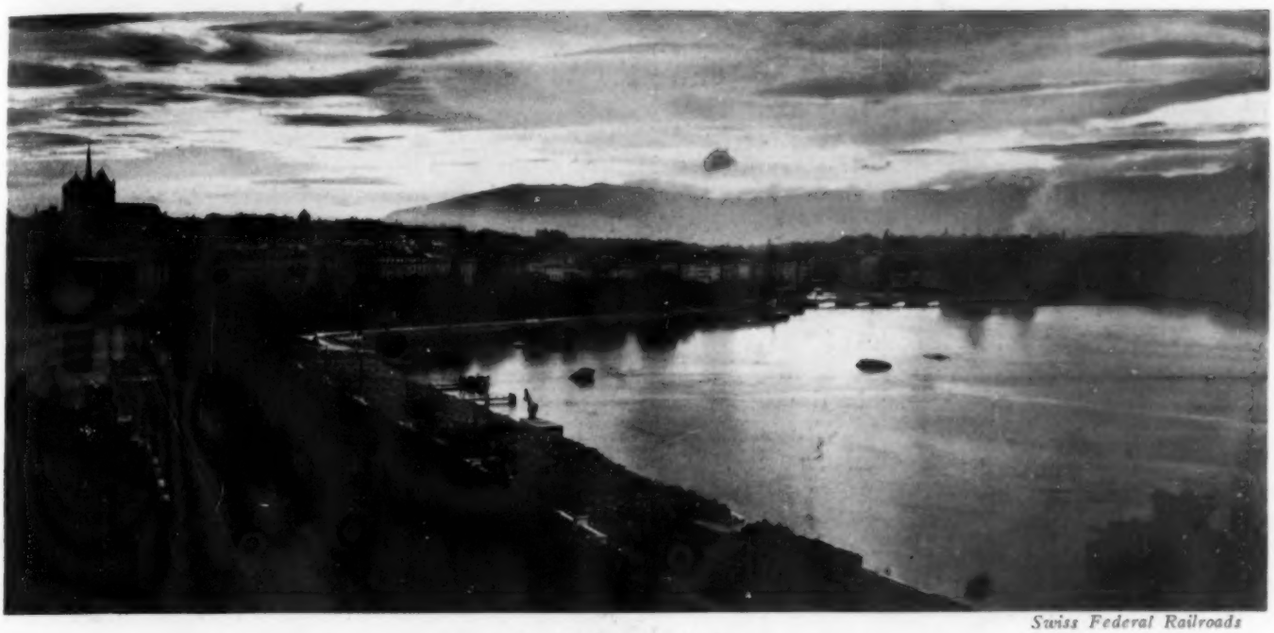


*The Castle of Chillon on Lake Geneva*



*Swiss Federal Railroads*

*The harbor of Geneva.*

# *A Pilgrim in the Hospital*

CHARLES ZUEBLIN

RESPECT for the laws of nature is the highest fidelity to the laws of God. The expectant mother must be freed from the burden of toil, but she needs wholesome activity; the adolescent youth must be allowed to dream, but organized athletics will appeal to his imagination; the lengthening focus of the eye at middle age may increase the joys of distant vision, but it is well to get reading glasses promptly; the mind may be fresh and the eye keen at three score years and ten, but most septuagenarians have long since given up tennis. Nature must be obeyed but can be mastered.

The instrumentalities used in conquering nature may be as humble as her own. Some modern religionists consider the surgical processes of the clinic an offense against divine law. In truth, the paradox of living is the conquest of nature by submission to her laws. Man's mission is to make nature his agent in improving the environment for higher life. *Laborare est orare:* to labor is to pray.

After I had made the decision to submit to an operation for hernia, a faith-healing friend tried dissuasion. Had she not experienced the cure of a dislocated knee which, on her husband's urging, she had submitted to a healer? She had not previously believed in the efficacy of prayer, but she was convinced by this three days' triumph. Why go to the operating room and permit presumptuous scientists to meddle with nature's processes? The answer is not merely one of demonstrated science. It is undoubtedly also a question of faith.

Does not the person who believes in the laying on of hands or the use of a talismanic book somehow visualize the way by which faith, possessing a disordered anatomic structure, adjusts it according to the accustomed physiologic laws? This pilgrim to the promised land of health used imagination—man's divinest gift, Mark Twain thought—to compel the belief that a competently trained scientist could restore disturbed members and repair broken tissue. It seemed as reasonable to cut tissue and sew it together again in order to prolong active life, by methods long proved experimentally, as to reclaim barren land and enjoy larger crops, aided by the same values of sunshine and rain that had been so largely wasted by leaving nature to her own devices.

So, with a feeling of devotion the pilgrim made his way at the end of a sabbath day to a Swiss clinic near Geneva that stands precipitately over the river Arve, looking toward the hills of France known as La Salève. The majesty of Mont Blanc is hidden by these hills, but the little valley of the Arve is idyllic with its sheltering background of the foothills. The only vesper song was that of the birds, yet all night the Arve babbled melodiously on its predestined course to the Rhone. The immaculate white-hooded nurse made the preliminary preparations for the ceremony of the

following morning, involving the casual performance of services most intimate with such dignity and quiet sympathy, that vulgar human emotions could have less place than they may have sometimes found in a sanctuary.

After the peaceful sleep of the faithful ready for the religious rite, the pilgrim, washed, shaved, and appropriately clad, walked with nurses to the operating room. At the door he divests himself of all lay habiliments, entering in the prescribed white robe. The dominant attribute of the room is purity. Where there are not essential instruments, faces, or hands, there is the purest of white. As the pilgrim lies on the operating table to be covered by soft cloths, as it is also covered, the high priest—the surgeon—and his coadjutor—the physician—are scrubbing their hands with diligence.

The scientist who is to attempt the delicate task of rehabilitating the disorded members of a human body is a member of an old Geneva family dating back to the fifteenth century and thence to Normandy. Like a true modern product, as measured by our accepted American standards, the germ cells of this ancient lineage have been kept fresh by wholesome admixtures. Perhaps the talented, tall, lithe, strong-featured French-Swiss doctor matured to science rather than art because his grandfather emigrated to England and his mother was born in Germany. At least the unlinguistic pilgrim was indirectly the beneficiary of the surgeon's English wife and his English speaking children.

The physicians draw over their faces white masks. The spotless nurses strap the pilgrim to the operating table. The room is flooded with pure white light. A local anesthetic is applied where the cut is to be made. The pilgrim is uncomfortable, apprehensive, but neither anxious nor skeptical. The legs refuse the calm surrender that the mind dictates. There are times when the fastening of the hands proves justified. A sense of numbness in the abdomen, however, is reassuring. The time has come to cut. It sounds like cutting a kid glove, and is no more painful. The only mental turbulence comes when the cutting seems indefinitely prolonged, due doubtless to cutting one tissue at a time. There are further injections of anesthetic as the cutting goes deeper. At length it is evident that the inner organs of a human being, so marvelously con-

*Mirzoff*

***Peace, beauty, and solitude.***

Mirsoff

*The majesty of Mont Blanc.*

cealed and protected by flesh and skin, are exposed. The passage of the tools is painless, but the pilgrim feels that he is turned Atlas with the disadvantage of supporting the world on his navel. Perhaps the unexpected pressure helps to reconcile the pilgrim to the rôle of auditor. Curiosity is powerful to see the inner structure of an organism with which he is so intimately identified, but the fear of nausea and the relentless pressure prevent his yielding to the temptation to be a spectator.

At length the process of salvaging has begun. The sensation of the pilgrim's white robe when under the sewing machine needle must have been very similar. There is the consciousness and relief of being put together again. The sensations have never been agreeable during this seventy minutes on the operating table, but an equal length of time spent by the acolyte continuously with unprotected knees upon the stone floor of the penitential cell must be as painful. Why are there those who consider this egotistical insistence on divine grace an act of holiness and the consecrated service of the clinic a profanation? The pilgrim, at least, in entering this room devoted to the scientific service of mankind had put off the footgear of the outer world with the feeling with which Moses obeyed the command at the burning bush. When carried forth from the operating room he was weak, but conscious that he had yielded himself to the best of his knowledge to what the devout call the laws of God.

Three immaculate nurses lift the patient from the table to a portable bed that is wheeled through the corridor and up in the elevator to his room where they lift him again to the bed on which he is to lie without worry or ambition, as their charge, for long days. Lest there might seem an unconcern in facing this novel adventure in a new world of physical and spiritual sensations, let it be confessed that the pilgrim had had one great doubt. His French would probably be inadequate to an experience involving a new vocabulary, but reassurance came promptly in the discovery that these French speaking nurses and maids were German-Swiss. He was not equipped to talk with them in the homely dialect of the land of his ancestors, but their knowledge of high German and his highly picturesque German made a happy and easy bond.

The nurse in charge, Sister Carolina, hails from Wintertur, not many miles from the valley from which the pilgrim's ancestors had emigrated to St. Gallen in the seventeenth century and to Savannah in the eighteenth century. Sister Carolina is of that sturdiest Swiss stock, broad-backed, broad-hipped, capable, industrious, tireless, with the obsession for cleanliness characteristic of her race. No baby in a lying-in hospital could receive more tender care or come more naturally to expect it than the pilgrim under this seductive considerateness.

When the bed is made up at night, a nice art with a helpless patient in it, Sister Carolina summons to her aid a novitiate, the merry Sister Ida, of this same robust German-Swiss stock. Sister Ida's hours overlap those of the day nurses, in this her month of night service. The nurses take turns in a month of night duty. For an hour before this preparation for the night, one learns to leave them undisturbed. This is the hour of their vesper meal, as evidenced by the concluding hymn. The spirit of unfailing kindness in the service of each patient has its counterpart in the beautiful fellowship among the nurses.

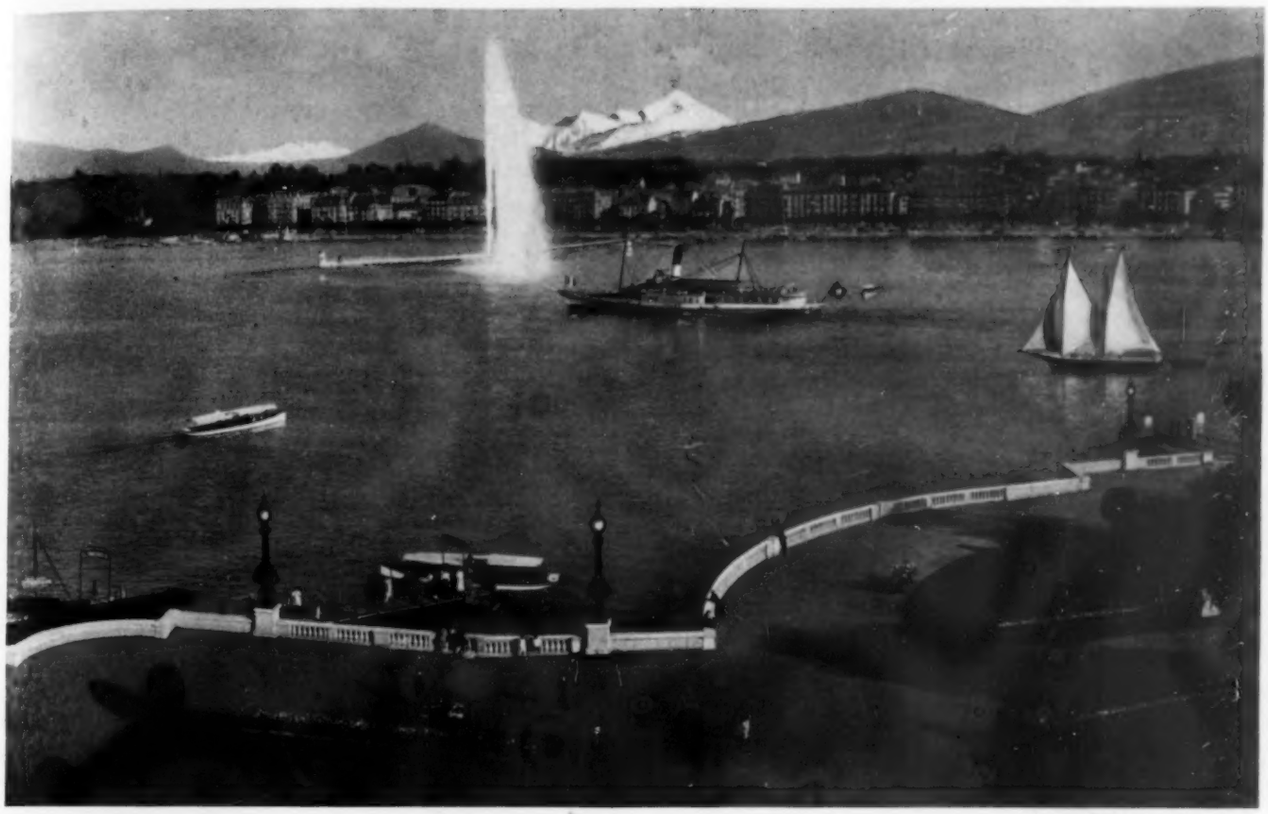
Faith is bulwarked in the hour of solitude by the assurance of steadying human companionship with the coming of another day. When the pilgrim came to the hospital in the buoyant company of Herself and our daughter and was ushered into the room made fragrant by their roses, and the next morning when they were there to welcome him on the return from his perilous venture to the operating room, he could not help thinking of the countless wounded soldiers in the World War who lacked such familiar fellowship. The early morning visit was easy because the anesthetic still had the pain under control. In the afternoon speech was almost impossible and the pilgrim was made conscious of the large part played by the abdominal muscles even in conversation. It was not a very hearty benediction that the father could give the daughter on her leave-taking for the Sorbonne, but he could sleep in peace with the assurance that the departure would be presided over by Herself with the same *savoir faire* that would make her silent presence desirable in the hospital on the next torturing day. It is on the second day that the patient gives almost his entire attention to his pains. His system is filled with gas which follows uniformly the line of the suture and explodes internally, racking the entire body. The pains are never so great as to obscure the skilled attentions of the experts or the comforting presence of Herself.

*Swiss Federal Railroads*

*The Château of Saussure near Geneva, which was at one time under consideration as the home of the League of Nations.*

The routine becomes interesting. One awakens daily to a wonderful landscape. From the pilgrim's bed the view is framed by a plump chestnut tree on the left and a couple of birches on the right. The mystery of perspective somehow makes evident that a beautiful clump of trees in the middle distance is much lower and far away. The fact is, just beyond the trees in the hospital grounds is the river Arve, many feet below. The distant clump of trees is of varied greens and shapes, punctuated by a solitary poplar. The remote background against which it is silhouetted is the forest-covered face of Salève, broken by long strips of bare rock. Every morning the view changes; sometimes the valley is filled with mist so that no objects can be distinguished; sometimes the middle distance trees are seen while Salève is invisible. Often during a month of exceptional weather the dawn comes with a purple aura behind Salève while the valley is still in darkness. Then the rising sun touches the gay greens of the middle distance trees; presently the whole valley is filled with such a glow that the eye cannot recognize individual objects. Usually in the early morning the streaks of rock on Salève are imperceptible; the whole seems to be a mass of verdure. With the waning day the rocks stand out with their own vivid coloring, so distinct that it seems impossible that they ever were obscured. Sometimes rain shrouds the whole valley. Sometimes great cumulous clouds marshal so imposingly, high above Salève, one is impatient to climb the nearby mountain and see this heavenly procession reviewed by Mont Blanc.

Towards evening the shadows lengthen, the little clump of trees is made brilliant by the declining rays of the sun. Then the light fades. Final bright shafts illumine the near-by trees. As these grow dull, Salève colors, rose perhaps, in the setting sun. The unnoticed noises of the day diminish; one has given no attention to the sounds of the house, the



*Swiss Federal Railroads*

*On Sundays and holidays the fountain in the harbor of Geneva throws a column of water two hundred and ninety-five feet high.*

nearby birds, the distant cow bells, the remoter autos, and far away trains, but now one is agreeably conscious of the gurgling river that sings all night as it sang unheard all day.

Advancing from September to October there is a daily as well as an hourly shift of color values; first yellow appears in the neighboring trees, then dots of red brighten the prospect. Each variety of tree in the middle distance clump has an individual change of color, from a brilliant spring-like green to deep red. In three weeks the entire color scheme of the landscape has altered from varied greens to golden browns. Autumn is here.

There is much to occupy one outdoors in marking the course of this changing panorama, but there are also indoor sports; the refreshment of morning and evening ablutions, the complete remaking of the bed twice a day without damage to the sensitive occupant, the three perfunctory meals and afternoon coffee that slowly become interesting, the doctor's early and late rounds, last, not least, the morning and afternoon visits of Herself with letters from our children, Geneva and Zürich papers, daily minutes sent by the League of Nations to its press representatives, an occasional book, and the periodic mystery of the unexpected.

At the end of a fortnight comes a unique experience. The stitches must be taken out. This simple and almost painless process is made impressive, as all treatment of the wound has been, by the meticulous attention given to sterilizing instruments and dressings. Modern scientific faith, in its antiseptic methods, shows a finer reverence for the laws of the universe than the ceremonial cleansings of the ancient religions.

It was not many days before the pilgrim was allowed to travel to the balcony in his bed. Then his restricted landscape expanded, embracing miles of the Arve valley, backed for most of its visible distance by the abrupt wall of Salève. The little group of middle distance trees proves to be part of a long wood, losing none of its beauty. The sentinel poplar is joined by a Lombardy procession, one of the peculiar tokens of France, marking the Swiss frontier. With the expanding view there come the sights and sounds of life; workers in the fields, moving carts, the vaporous trail of the invisible train, and along the base of Salève scattered houses and farms.

The adventure is not complete without the inevitable setback. Because the pilgrim had been allowed to leave the confining bed and sit almost like a man for several days on the balcony, nature decides that the processes are not conforming precisely to divine law. A little hemorrhage of the lung invites violent cramps, the hot applications required to relieve the cramps burn the back, so that the

pilgrim spends another week in bed, this time immovable; even the experimental journey to the balcony is tabu. There are more hours of meditation, testing ones faith in the divinely appointed artisan who had presumed to adjust nature's handiwork. Sluggish blood flowing through an inactive body, lungs insufficiently used, a stomach inspired by no healthful exercise are violating nature's design. With returning strength, bodily movement, and fresh air, normal functions are restored. Meanwhile a system long disorganized has been repaired and nature gives promise of setting its seal of approval in vigor and years. The trial of faith and the test of science are vindicated.

The marvels of science have been in evidence within the hospital and the marvels of nature without. The trees are headed toward their winter sleep, but there is no doubt about their revival next spring. The birds will migrate, but they will return with the budding of the trees. The crops have been gathered, but after man's science has manipulated the earth there will be fresh crops and fresh harvests. To learn the laws of nature and expedite their tedious and expensive processes is surely to follow divine law. Unity and harmony invite man. He is free to choose the law of the jungle or the love of the family. He may make a World War or a League of Nations. Who shall say that war is natural and peace unnatural. Who shall say that faith healing is more divine than scientific surgery. *Laborare est orare.*

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# *Which Shall Live—Men or Animals?*

ERNEST HAROLD BAYNES

IF the United States were threatened with invasion by a foreign power, even if we knew that the invasion would be only temporary and that only a few thousand of our citizens would be killed, the whole country would be aroused in an effort to prevent that invasion. If necessary, millions of men would be drafted and trained to meet the invaders, and billions of dollars would be expended to protect those few thousand people from the death that must otherwise overtake them. In such a case, every real man and every real woman in the country would be doing something to insure the defeat of that invading army. Yet such an army is like a box of tin soldiers compared with armies that threaten us all the time, but which cause scarcely an extra beat of the nation's pulse. I refer to the armies of disease. The army of bubonic plague alone, if permitted to effect a foothold on our shores, might at any time ravage our cities as it once ravaged the cities of Europe and Asia, leaving scarcely enough living to bury the dead. We read in DeFoe's "History of the Plague" in London in 1665 of "people in the rage of their distemper or in the torment of their swellings, which were indeed intolerable, running out of their own government, raving and distracted, and often times laying violent hands upon themselves, throwing themselves out of windows, shooting themselves, mothers murdering their own children in their lunacy." Indeed, we do not have to go back so far to realize what the plague can do. In 1905 in India alone there were 1,040,429 deaths from this one disease.

*If your child were bitten by a mad dog, would you let it die, or would you have it given the Pasteur treatment? If your child had diphtheria, would you take its chances of recovery, or would you want a physician to administer antitoxin? If so, you would be benefiting by research work on animals. Are you opposed to such work? Once Mr. Baynes, a naturalist, president of the Meriden, New Hampshire, humane society, and author of books on animals, believed it wrong to use animals in studies. He investigated the work being done. This paper gives his present convictions.*

### The Conquest of Bubonic Plague

In this country no layman loses any sleep on account of bubonic plague. Is that because it does not exist? Not at all. It comes to our waters, even effects a landing sometimes. But we have a small garrison of vigilant medical men on our coasts watching day and night for that enemy, ready to give him instant combat if he comes. We sleep in peace because we trust that garrison. Thirty years ago we did not know what caused this terrible plague, but in 1894 the germ (*Bacillus pestis bubonicae*) was discovered. Even then it was not known how the disease was carried or what caused it to spread so rapidly—and before it could be combated successfully, that must be known. A series of experiments on

living mammals, chiefly rats, guinea pigs and monkeys, yielded the desired information and through these experiments we have been delivered from this terrible scourge. It was known that rats were subject to plague; consequently attempts were made to find out how it was transmitted from one rat to another. The idea that it might be carried by parasites occurred to several investigators. Accordingly, healthy rats were placed in cages close to diseased rats; they remained perfectly well until a few fleas were introduced. Then, almost immediately, the hitherto healthy rats were stricken with plague. Cages containing healthy monkeys were suspended over cages occupied by diseased and flea-infested rats. At regular intervals the monkeys were lowered nearer to the stricken rodents. The monkeys were all right until they were brought within jumping distance of a flea, when they at once contracted the plague. These and other experiments left no doubt that rat fleas were the carriers among animals, and since rat fleas also feed on man when their natural prey is not available, it was an easy matter to show that the plague is spread by means of rat fleas. This led to a definite program for checking the spread of the disease, by relentless warfare on fleas and the rats that carried them. The rats were trapped, their breeding places destroyed, and diseased rats from infested ports were prevented from entering

*Does this dog look unhappy? Ten years ago Buster had an operation performed on the stomach; the results have been of aid in the study of digestion. Buster has not suffered thereby, and she has saved much suffering to others. She is receiving a visit from the author.*

the country. For example, when it was found that rats frequently come ashore along the cables stretched between the ships and the wharves, metal cones similar to those used to prevent rodents from climbing into corn cribs were placed on the cables. The fact that I wish to emphasize is that it is due to experiments on living mammals that this black death is no longer a terror to us.

### Experimental Study of Health and Disease

Until the middle of the last century very little had been done in the way of experimental study of physiology and pathology. Physicians depended almost entirely on bedside observations. Some of these physicians were wonderful men, and often their observations were remarkably shrewd. But the human body is a complex machine, the organs are so interdependent, that in the presence of any given set of symptoms and signs of disease, it was almost impossible to be sure just what caused them, and, consequently, what was best to do for the patient. When the experimental method was adopted disease could be studied systematically, conditions could be controlled, and the phenomena that resulted could be studied intelligently because the experimenter knew exactly what had produced them. In such experiments mammals are the animals chiefly used, because in most respects they most nearly resemble man, himself a mammal. Practically all the domestic mammals have been used, horses, cattle, sheep, goats, swine, dogs, cats, rabbits, guinea-pigs, and rats and mice; monkeys are also used. And all have made wonderful contributions to medicine or surgery or both.

*This is Whitey, about eight months after the complete removal of the parathyroid glands. These glands are quite often partly and accidentally removed during operations on the thyroid gland in man, with alarming and sometimes fatal results. Following complete removal of the parathyroid glands, carnivorous animals, including man, die within from four to six days. As a result of experimental work on this dog and other animals, three effective curative measures have been developed, which indefinitely preserve the life of such animals in normal health. Two persons are known to have been saved and several others have been rendered free from symptoms as a result of this study.*

*These children at the Anna Durand Hospital, Chicago, have been saved from death from diphtheria by the use of antitoxin. The boy in the center has a squint as the result of his sickness.*

## Types of Experiments on Animals

### I

There are several classes of experiments. Some are in the field of pure research, not having for their object any immediate benefit to man or animals. Experiments of this nature were carried on some years ago in work on bubonic plague among rodents in California. It was discovered that ground squirrels had a disease similar to plague and yet distinctly different. By a long series of experiments it was found that monkeys are susceptible to this disease, and it was predicted that eventually cases would be found in man. As a result of this work a bacteriologist in Cincinnati was able to identify the disease in persons in his own vicinity. Another investigator found it among persons in Utah, and showed that it is carried from infected rabbits and ground squirrels by biting insects. It also was shown that the disease is widespread over the United States. With this knowledge of the means of transmission of the disease it is comparatively easy to prevent the infection of man.

### II

Another class of experiments is carried on by surgeons to develop dexterity before they attempt operations on man. Such experiments are usually carried out on dogs. The animals are invariably under complete anesthesia and usually they are killed by added ether at the end of the experiment.

Recently I attended the clinic of a throat specialist in the east. I saw child after child wheeled into the amphitheater and relieved, usually in a few moments, of foreign bodies that they had swallowed and that a few years ago would in many cases have caused death, either directly or as the result of a dangerous operation. So dextrous is this man that his little patients do not need any anesthetic. After his work was done I had a talk with him, and he told me that the technic of these operations had been worked out with great care on dogs that were always under an anesthetic. He also told me that by the use of two dogs he had trained fifty other men to do similar work.

### III

In the Civil War if a man was shot through the bowels, he was doomed to death; the surgeons hardly dared to open the abdomen and if they did they didn't know how to join the ends of the bowel so that they would not leak. Of course the slightest leak meant infection and death. Then came along an experimenter who etherized about thirty dogs, shot them through the bowels, and practiced joining bowel ends until he could make a perfect joint. It is safe to say that in the World War the lives of thousands of men were saved as a result of that series of experiments.

Lockjaw, tetanus, chiefly a disease of war, that threatened to take frightful toll of soldiers wounded on the tetanus-infected battlefields of Europe, did little damage during the late war because of antitetanus serum made from the blood of immunized horses. Every wounded man received an injection of this serum at the earliest possible moment, and usually the length of time that had intervened determined whether the man would live or whether he

*The homes of this boy and girl have to thank research workers and animals for the lives saved by antitoxin for diphtheria. Without antitoxin, developed by experimental work on animals, such children would have had slim chances of recovery.*

*On the roof garden of the Home for Destitute Crippled Children, Chicago. Suppose one of these victims of infantile paralysis were your child? Would you hesitate to sacrifice under ether one or more animals if through the knowledge gained the disease could have been prevented, or your child could have recovered without being crippled?*

would die the most distressing and horrible death.

The antityphoid vaccine, also worked out on mammals and tested on mammals, has practically abolished typhoid fever in soldiers' camps. It is estimated by the Surgeon General's office that during the World War it saved the lives of 60,000 men in the American army alone.

### Benefits of Experimentation to Man

These are only a very few examples from the long list of benefits that have accrued to humanity through the use of living mammals for experimental purposes. I must mention only one more—the recent discovery of a specific treatment for diabetes. Less than two years ago I invited a little girl to go for a bird walk with me that I might give her the pleasure of stroking and feeding a wild bird in its nest. I was particularly eager that she should enjoy that day, because both she and I knew that she had not many days to live. She was doomed to die of diabetes within six months; as a matter of fact, she died in less than three months from the date of our walk. I remember thinking that I would give anything I possessed if I could by some miracle restore that child to health. Today, less than two years later, that miracle could be performed, because Dr. F. G. Banting of the University of Toronto, by a brilliant series of experiments on dogs, has completed investigations begun on rabbits by Claude Bernard seventy-five years ago. The story of this wonderful discovery is long, but here are the outstanding facts. It was found that when the pancreas of a dog is removed, the animal at once develops acute diabetes and usually dies of that disease within three or four weeks. Under the microscope the pancreas is seen to be studded with countless little bodies, known as the islands of Langerhans, after the German scientist who discovered them. It was found that these islands secrete a substance quite different from that secreted by the rest of the pancreas, and that it is the absence of this substance, not the absence of the pancreas itself, that causes diabetes. A method was devised for obtaining an extract from these islands of Langerhans, and it was found that when this extract was injected into a dog whose pancreas has been removed it did not die, but got well and continued to be well as long as it was given injections of this extract. After these injections had been proved to be safe by repeated experiments on dogs, they were tried on human patients with startlingly beneficial results. Even when the disease is of long standing, when the patient has reached the very last stage and is in the coma that immediately precedes death, injections of this extract, now known to the world as insulin, will bring him out of the coma, snatch him from the very jaws of death, and restore him to health.

### The False Stand of the Antivivisectionists

We have seen that all these great advances in medicine and surgery have been made as the result of experiments on living mammals,

Pacific and Atlantic

*Not man alone, but animals also have benefited by experimental work. The best example of this is the conquest of hydrophobia.*

and you will agree, I believe, that in all probability further advances in these fields must be brought about by the same means. This is the opinion of practically all eminent physicians and surgeons and veterinarians, and of all the great scientists and educators in other fields—in short, it is the opinion of all persons who have vast responsibilities for the health of men and of animals. The only persons who are opposed to these reasonable experiments are the antivivisectionists, who have no such responsibilities. Would any sane person think of going to the antivivisectionists for help if there were an epidemic of smallpox or diphtheria, or if there were an outbreak of hog cholera or of blackleg in cattle? We don't go to them because they know nothing about such matters. Yet they boldly contradict all competent authorities and tell us that experiments on animals are useless, that they have never accomplished anything. The antivivisection societies are composed largely of well disposed but woefully misinformed persons. And those who are responsible for the misinformation are the leaders of the antivivisectionists. I have been studying these leaders for some years, and I may say, without any danger of my statements being disproved, that among them may be found many of the most dangerous of the criminal insane to be found in this country today—and I have recently visited some of our largest penitentiaries and asylums. I have found some of these leaders of the antivivisection movement to be guilty of falsehood, slander, libel, perjury, forgery, and attempted bribery. Under false pretenses they obtain money from weakminded and unthinking people and, with this money, they wilfully and perennially attempt not only to prevent the advance of medicine and surgery, but also to break down the bulwarks of preventive medicine by teaching contempt of vaccination and of the use of antitoxins.

Few of the criminals in our jails are responsible for the deaths of more than a small number of persons; few of them have attempted widespread destruction of life. But it is the opinion of eminent physicians that through the pernicious teachings of the antivivisection leaders we shall in a few years have epidemics that will destroy the lives of many thousands of children. Unless we wish for a return of the plagues and pestilences that once devastated wide areas on this world before the introduction of modern methods, we should use every means in our power to discourage these dangerous fanatics. I believe that it is the duty of all good citizens who belong to antivivisection societies to send in their resignations at once, and to stand with our government, our great physicians, surgeons, veterinarians, agriculturalists, educators, and divines in approving and supporting properly conducted animal experimentation and sane humane education generally.

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After the presentation of this paper by Mr. Baynes before the American Society of Mammalogists, at its fifth annual meeting, May 15 to 17, 1923, in the Academy of Natural Sciences, Philadelphia, the Society unanimously passed these resolutions:

WHEREAS, It is a fact known to all thinking people that most of the great advances in medicine and surgery have been made as a result of experiments on living animals, especially mammals, and

WHEREAS, It is the belief of our eminent physicians, surgeons, and veterinarians, and all others having great responsibility for the health of human beings and of animals, that future advances in these fields will be made chiefly as the result of similar experiments, and

WHEREAS, It is known that these experiments almost invariably are conducted humanely and with a minimum of discomfort to the animals used, and

WHEREAS, There is an organized movement being carried on by certain misinformed and misguided individuals who seek to prevent or seriously interfere with such experiments, be it

*Resolved,* that we, members of the American Society of Mammalogists, in annual convention assembled in the city of Philadelphia, on the sixteenth day of May, 1923, are of opinion that, in the best interests of real humanity, animal experimentation, including vivisection, as practiced in our laboratories today, should continue unhampered.

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## EVERY NEW DRUG MUST HAVE ITS FIRST TRIAL

The medical experimenter is unalterably opposed to wanton cruelty wherever found, and will lend moral and financial support to any movement directed against it. The only conflict that exists is that those in favor of animal experimentation demand that the lives of a few animals may be sacrificed in the most humane manner possible for the benefit of the human race and the remainder of the animal world. The proposition may be briefly stated in this way: Every new drug must have its first trial. Shall this first trial be on man or on animals? Each must answer this question for himself; but the answer must be made with the full knowledge that drugs act very similarly on man and on animals.

—JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

# Uncle Sam's Fight on Germs

## I. How He Goes About It

E. K. FOLTZ

THERE, I think that will hold us for a while." A woman raised her weary eyes, clipped some papers together, and left the building. She was a government bacteriologist at the head of a research unit and had been on continuous duty for twenty-eight hours. From eight o'clock in the morning until noon of the following day the group of which she had charge made hourly observations on a particular phase of treatment by serum that suggested an improvement in coping with pneumonia.

This is but one of a multitude of almost daily incidents among Uncle Sam's staff of scientific workers engaged on problems of health that intimately concern every man, woman, and child throughout the country. Seeking no glory, never featured in the newspapers, unknown outside their limited sphere, more than a hundred men and a score of women have been brought to the Hygienic Laboratory by the federal government and directed to make studies on matters pertaining to the public health.

The activities on which these men and women are engaged cover such diverse studies as the simple testing of serums for purity and strength to hydrogen-ion concentration and the treatment of tuberculosis, based on chemistry. The conditions under which they work vary with the nature of their researches. In one of the laboratories two men are trying to unfold the secret of Rocky Mountain spotted fever—one of the most fatal infections known in the United States and an economic problem of much importance in certain parts of the northwest. In another building several chemists are trying to determine what rôle oxygen plays in disease, assuming that body changes are essentially chemical. Another section is trying to find out some new truths in biology.

*The department of the federal government that is now responsible for testing the purity of vaccines, serums, and the antitoxins that are manufactured by commercial houses and sold through drug houses is the Hygienic Laboratory of the United States Public Health Service. Thirty-five years ago a small laboratory in the federal marine hospital in New York marked the beginning of the present department; its equipment was a few test tubes and a microscope or two. Today the Hygienic Laboratory is housed in a group of buildings on a five-acre tract in Washington. Its growth parallels the growth of the knowledge of bacteria and of Uncle Sam's concern for the health of his people.*

### Back in 1887

Starting back in 1887 as a small clinical laboratory attached to the marine hospital in New York, with a few test tubes and a microscope or two, the United States Hygienic Laboratory has grown by successive stages until today the institution is housed in a group of buildings on a five-acre tract overlooking the beautiful Potomac in the city of Washington. While not ideal in every respect, much of the physical equipment is all that could be desired, affording proper facilities for carrying on advanced researches into the cause, prevention, and cure of disease.

Before the days of bacteriology, when infections were attributed to "miasms" and bad air and bad water and other things that, for lack of knowledge, were generally considered "bad," there was no such thing as a science of public health. In those days it was not considered good form to think ahead of the game. A man who did any original thinking, unless it pertained to ways of beating the other man to the dollar, was looked upon as queer. When a person got an idea into his head that conflicted with the accepted dictum of science, he was forced to creep away and work it out all by his lonesome. As for a woman's seriously undertaking a trip into the unbeaten paths of medical research, that was a thing quite past the understanding; men winked an eye and tapped the head; women held up their hands in horror.

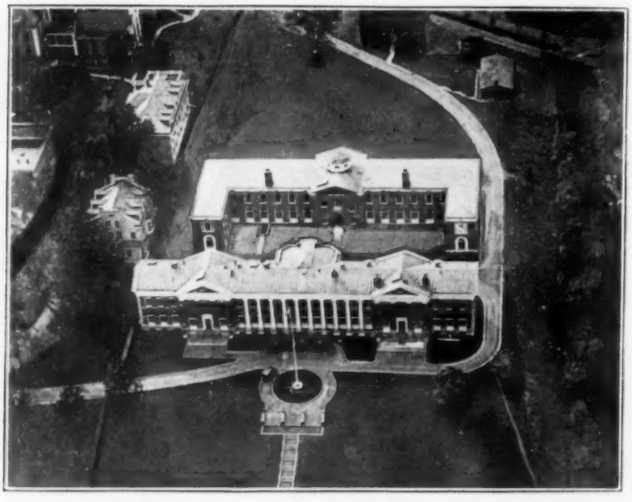
All that has passed. Today the search for knowledge is organized. It is no longer necessary or advisable for a person of original thought to play a lone hand. And it makes no difference whether that person is a man or a woman; young or old; Jew or Gentile, Catholic, Protestant or agnostic; Republican or Democrat; stout, thin, or medium—no difference so long as the person has the ability to delve into the unknown and stay delved until he

brings forth results. These results may be positive or negative; but they must be accurate, not guesses, so that when they are given out to the medical world the physician applying them may rest assured that he is dealing with facts so far as it is humanly possible to obtain them.

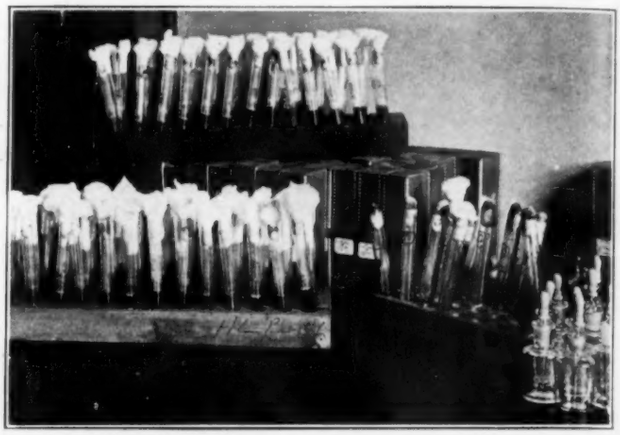
### Organizing the Hygienic Laboratory

That the observations made may be utilized to the utmost benefit, it usually becomes necessary to assemble them and interpret them in connection with other facts. With this object in view, the work must be organized, the studies systematized, so that when it seems advisable to undertake an investigation it may be divided among the scientific staff, each member of the unit devoting his or her energies to solving some particular phase of the problem. To accomplish this, the Hygienic Laboratory functions on a systematic basis.

The institution is presided over by a director who, the federal statutes require, must be a commissioned medical officer of the Public Health Service. He is selected by the surgeon general from among the staff of officers and he must be not only a man of eminent scientific attainments, but also must possess marked executive ability. As is quite well known, scientists are usually wretched executives. They become so wrapped up in their work that all else goes by the board, and when the matter of directing others comes up they neatly side-step the issue and let George do it. When, therefore, it becomes necessary for the head of the Public Health Service to choose a man to direct laboratory activities, he is likely to draw a long breath and look right solemn. Facing this possibility at the most unseemly time, he has adopted the happy plan of assigning a number of officers each year to the laboratory where they receive a thorough graduate course in all branches of laboratory technic, and incidentally learn how the executive end is handled. From these graduates the most promising are garnered from time to time and put in charge of field researches —local epidemics, outbreaks of unknown infections, and investigations of problems in sanitation and hygiene. So well has this plan worked out that at present, with singularly few exceptions, all the men at the head of affairs in the federal Public Health Service have "served time" at the Hygienic Laboratory, Surgeon General Cumming himself included.



*Where Uncle Sam conducts his research on diseases of man—the Hygienic Laboratory, Washington, D. C. This photograph was taken from an airplane at 1,000 feet elevation.*



*A few plants in Uncle Sam's garden of germs. These tubes contain some of man's worst enemies, the organisms which cause leprosy, diphtheria, anthrax, tetanus, typhoid fever, and botulism.*

The scientific studies of the laboratory are distributed through various departments or "divisions," as they are called for the sake of convenience. When, for example, a health officer in a western state runs up against a new disease—and new diseases, by the way, do break out in the most unexpected way—he immediately gets busy with the local physicians, and it is only a matter of a short time until Washington is called on to make an investigation. In a case of this kind the bacteriologic phase of the investigation is turned over to the division of pathology and bacteriology, and it is up to the specialists in that branch of science to get results. Perhaps a chemical problem is involved, in which event the staff of chemists is called on.

### Scotching a New Disease

One of the most recent examples of the type of work which the Hygienic Laboratory is called on to undertake developed about two years ago and has just reached definite conclusion. For some years in parts of Utah a disease, locally known as deer fly fever, has

affected certain rodents, notably the jack rabbit. Now it is a long cry from jack rabbit to man. Why worry about a rabbit? There are plenty of rabbits to go around, although some of them do die off. If this disease, very fatal to jack rabbits, had confined itself to the jack rabbit it would have resolved itself into an economic boon, because jack rabbits are a pest and their eradication could partially be accomplished by spreading this disease among them. But tularemia, as the disease has been renamed, did not confine itself to the rabbit. As with many other disease germs, the organism causing tularemia in rodents found the human body a good place in which to thrive and soon the physicians were called on to treat a jack rabbit disease which had been communicated to man and about which they knew nothing.

While the disease is almost uniformly fatal to rabbits, squirrels, mice, and guinea pigs, its death rate in man is low. But the sickness rate is high. Persons who come down with the disease become very ill. Certain glands, particularly those under the arms and in the neck, become involved and often discharge pus, causing the unfortunate victim to be laid up in bed with fever for from three weeks to two or three months.

When a malady of this severity appears in a community people take notice, and it is not long until the state health authorities adopt suppressive measures. In waging war against a disease of remote origin and unknown means of spread, however, little can be accomplished before the fundamental nature of the infection is determined. In other words, it is necessary to locate your enemy before you can hit him. So it proved with tularemia. The Hygienic Laboratory was called on for assistance and a skilled bacteriologist was at once detailed to the work. He hied himself to the zone of infection and the first thing he knew he was down with the disease. Another man was sent out. Profiting by the experience of his fellow officer, he approached the problem with due respect. He set up a small laboratory in the community, but soon discovered that the mysteries of the disease were not to be unfolded easily and, with a supply of material including a number of infected animals, transferred his activities to headquarters in Washington where every facility was placed at his disposal.

Scarcely was this officer located in the Hygienic Laboratory than he became infected and landed in the hospital. Another took his place, but the hospital claimed him also. Three assistants followed suit one after another, each of them being sick about eight weeks. With the recovery of these patients the laboratory found itself supplied with a fine crop of "immunes" for continuing the studies without much fear of dire consequences.

*This government bacteriologist is hunting for "wild" organisms, those whose properties are yet unknown, in the attempt to learn whether or not some of them are concerned in producing botulism and limberneck.*

With an efficiency record of 100 per cent. among those who had handled infected animals, the question of how the infection was transferred from animals to man presented itself. The organism itself—an exceedingly small living germ visible only through the most powerful microscope—had been discovered some time prior and named *Bacterium tularense*. In Utah the field investigators had definitely proved that tularemia is transmitted from the jack rabbit to man by a blood-sucking fly, the *Chrysops discalis*, prevalent during June, July, and August. The *Chrysops* evidently preferred a diet of rabbit but, not being overparticular in its habits, was not adverse to eking out a meal on a convenient human being and thus acted as the unwitting carrier of the infection from a sick rabbit to man.

### How Jack Rabbit Disease Is Carried

Inasmuch as the tularemia season in Utah coincided with the *Chrysops* season, a person not thoroughly up on the subtleties of germs would naturally conclude that the disease is wholly dependent on the fly as a carrier. But when the workers in a screened laboratory fifteen hundred miles east of the Chrysops-jack rabbit country fell ill, it was evident that the infection was transmissible by some other

means. And so it proved. Investigations demonstrated that the organism is so minute that it can pass through the unbroken skin and that anybody handling the animals used in experiments on tularemia is sure to get the disease, if he dissects them or handles dissected animals. It was also learned that when a healthy rabbit comes into contact with a rabbit infected with tularemia it develops the disease and dies—a significant point that was promptly seized on by those interested in the preservation of such a fine little creature as the rabbit. It was soon learned, too, that the lice of the rabbits are the means by which the disease is spread among the rabbits.

### Combating Jack Rabbit Disease in Man

Once the problem of what tularemia is and how it is transmitted was solved, the question of combating the disease in man presented itself. In view of the great advances made in treatment with serums in fighting the diseases of man and of his animal friends, attention has been directed to the finding of a serum that will be beneficial either in the prevention or the cure of the disease in man, a phase of the studies which has not yet been completed. As a result of two years of constant work, involving many near-tragedies for those engaged on the researches, man has laid bare many of the mysteries of another disease which give hope of a cure for the malady.

The importance of tularemia as a factor in national health did not become apparent until about a year ago. At that time it became necessary to secure the internal organs of presumably healthy rabbits for comparative studies. The natural place to go for these was the Washington market, and here an interesting discovery was made. An inquiry for rabbit livers was so novel that it excited not a little curiosity among dealers in game, particularly when the customer was recognized as a physician.

"Say, Doctor," one of the market men inquired, "is there any harm in asking what you want those livers for?"

"Well," replied the bacteriologist, "we've found a new disease in the jack rabbit that a man sometimes catches, and I'm wondering why the jack rabbit gets it and the common cottontail doesn't."

"I reckon he does," the man remarked, "if it's what you call rabbit fever."

"Rabbit fever? I've never heard of that."

"Oh, it's just a name among us market men. The cottontail season comes on late in the fall and early winter, when rabbits are shipped to us by the barrel from all over the country —Tennessee, Kentucky, Missouri, Kansas, North Carolina—any place where rabbits are plentiful. A good many customers want their game dressed, and if we put on a new man who hasn't had much experience in dressing rabbits the first thing we know he gets sick with rabbit fever. There's a man right over there," pointing to an employee, "who has just got over it."

The bacteriologist at once got busy. He examined the man, got a specimen of his blood, and found that it gave a perfect reaction to tularemia, showing that the man had had an attack of the disease, no doubt contracted while dressing rabbits in the market. Subsequent inquiries among market men developed the fact that "rabbit fever," or tularemia, is a well known disease among persons who handle rabbits, and further investigation disclosed the fact that infected rabbits were being offered for sale in the markets. So when the last word has been said, a disease of man which was supposed to be local in Utah turns out to be one of probably wide distribution.

[*To be continued.*]

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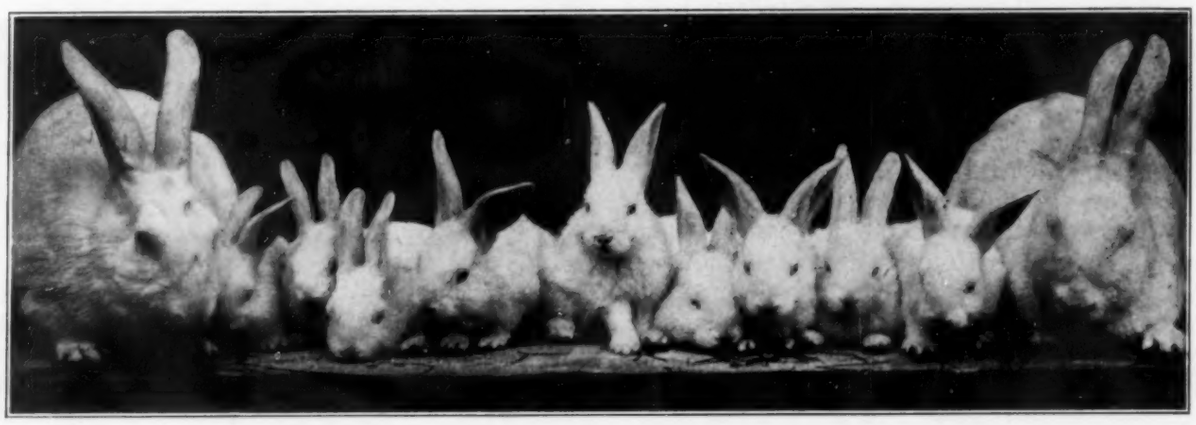

# The Hygiene of Country Schools

TALIAFERRO CLARK

A STATE board of health in the south was holding a free dental clinic in a rural school of a well-to-do community during vacation. Several mothers were there with their children. While they waited their turn in the chair, they commented on the antique desks and the poor heating arrangement of the otherwise good school building. The representative of the state board of health inquired why the teacher, whom he knew to be a very capable woman, had not helped the school committee to bring about the desired improvement.

"Oh! the committee could not stand her, so they fired her in the middle of the session," explained the wife of the chairman of the school committee.

Of what sort of conduct could the teacher have been guilty to merit such drastic punishment?

"The first thing she did was to say there ought to be two sanitary privies on the schoolhouse plat, and you know they would have cost at least forty dollars, and Buck, that's my husband, you know, said it wasn't any use wasting so much money, and he didn't pay any attention to her. The next thing she wanted was three jacketed stoves, one for each room. As if they needed that many!"

At this point another woman from the neighborhood interrupted with indignation, "Cousin Buck said he never heard of such a thing!"

But the blow that sent the teacher back home came when she kept the pupils sitting quietly at their desks at noon for twenty minutes eating their lunches, and then packing the scraps back in their baskets to be carried home for the pigs—a practical lesson in food habits and thrift.

Fortunately, this attitude toward capable teachers is not reflected in every rural community. In many states, teacherages, dwellings for teachers, are being provided so that experienced and competent teachers may be attracted to remote districts.

*The man from the country speaks with affection of the little red schoolhouse at "the corners." But this affection should not cloud the fact that the little red schoolhouse has been a means of spreading colds and measles in the winter when the air is either hot and stuffy or cold and drafty; of injuring eyes by small, poorly placed windows; and of breeding a dislike for school by lack of facilities for play, indoors and out. The country school should have the same opportunities for health that the city school affords. Communities where this is not the case can benefit by the suggestions in this paper, which are based on a study of rural schools made by the United States Public Health Service.*

## The Beginning of School Hygiene

Supervision of the health of school children in this country was first started about thirty years ago, when it was limited largely to inspection for the control of communicable disease. It has undergone gradual evolution until its scope is now much wider than was then believed possible, although it is still largely confined to cities.

The enormous loss of child life in the warring countries of Europe during the World War, the potential loss of life through reduction in birth rate, due to war conditions, and the great work of the American Relief Administration for starving European children have focused attention the world over on child health problems as never before. More recently the propaganda associated with federal legislation for the welfare and hygiene of mothers and babies has brought attention to the health needs of expectant mothers, young mothers, and infants, and through them to the relative neglect of health problems of that 20 per cent. of the total population that is enrolled in schools. Because homes can be reached fairly easily through health work in the schools, measures for the protection of mothers and infants are arousing renewed interest in school health supervision, both in the cities and in the country.

## Some Handicaps

The essentials for healthy school children are practically the same in the city and in the country. A complete school program must include sanitary school buildings and grounds, medical inspection, nursing service, health instruction, and physical training. In building, equipping, and maintaining school buildings, due attention should be given to location, facilities for play, proper regard for heating, lighting, ventilating, seating equipment, and sanitary conveniences. In country schools, supervision is handicapped by the standards of the communities, by lack of knowledge of health principles and of relative health values,

by the combination of want of funds and unwillingness of the authorities in many instances to spend funds for seemingly intangible results, and, except within recent years, by the want of state supervision and assistance. More than one half of all the school children of the country attend rural schools, and a large percentage are without any health supervision whatsoever. It is a serious matter that such a large proportion of the children of impressionable age are attending schools without the advantages of sanitary and medical supervision. This is all the more regrettable because in country communities—as in cities—numerous children are suffering from curable defects, which, in the country, are not cured because of the lack of skilled medical service.

### School Medical Inspection Laws

The slow development of school health work is largely due to the conflicting jurisdiction of the state health and education authorities and the inadequacy of the laws regulating inspection in schools of many of the states.

In some states, school health supervision is administered jointly by the state health and state education authorities, in a smaller number by either the state health department alone or the state education department alone, while in an appreciable number the law does not designate any state administrative authority. Furthermore, the administrative authorities in the majority of states are local boards of directors, school boards, boards of trustees, or other local bodies, many of which are more interested in the present saving of funds than in the future benefits from school health work.

Probably the most serious failing of school medical inspection laws is that so many of the laws are permissive only, that is, they state that so and so may be done. This is of serious consequence to country school children, because the states in which there are mandatory school requirements, those that state that so and so must be done, the country school children comprise but little more than one third of the total school enrollment, whereas the enrollment in states with no medical inspection laws or with only permissive laws, approximates two thirds.

*The condition of this school outhouse was an index of the attitude of the community; medical examination of the children was refused by their parents.*

The adequacy of the medical examination required by law also varies widely in different states. In some states the law specifies examination for sight, hearing, and other physical defects; in others for sight, hearing, teeth, and mouth breathing; in two states for sight and hearing only; in two for dental examination only; and in one state only for tuberculosis in teachers. Better laws for medical inspection of schools with mandatory health provisions and the fixing of responsibility will greatly advance rural school health work.

### Special Needs in Rural Districts

There are special reasons why the supervision of the health of country school children is necessary. These reasons have been revealed by intensive studies of their school conditions conducted by the United States Public Health Service. Country school children constitute more than 50 per cent. of all school children in the United States. Many of them are required to attend schools that are inadequate for health or education. They are largely denied the medical and surgical attention by specialists so easily had by city school children through clinics and hospitals. They do not receive the benefits of general sanitary measures, such as a good common water supply and the safe disposal of human excreta. They are unduly exposed to endemic diseases, such as chronic malaria and hookworm, which diminish vital resistance and retard physical and mental development.

### The New School Environment

One of the important shortcomings in the physical care of country school children relates to the school environment. In former years the school site was usually selected because it was unfit for a farm, a home, or almost any other purpose, and without regard for the distances the children had to come, possibilities for play, drainage, or the proximity of nuisances. It is not unusual to find country schools some distance from the main highway, perched on some rocky knoll without any playground space. The modern conception of the country school is an attractive building on a well drained plot with ample playground space that is most accessible to

the larger part of homes from which the children come, and remote from nuisances. It is a place where a well child may continue to grow and develop and where a weakened child may obtain the best development possible. Besides meeting the health and educational needs, the school building should be even more attractive, if possible, than the average homes of the pupils—a factor of importance in reducing truancy.

### The School Plant

There are about 186,000 one-teacher rural schools in this country. Many of these buildings are old, in bad state of repair, and designed without regard to the hygienic needs of children. I recall visiting one rural school that was a converted cornhouse, and another primitive structure that had been attended by the great-grandparents of some of the children.

Great advances are being made in this respect, however, and in some sections of the country the consolidated rural schools compare most favorably with the best city schools in appointments for health and for education.

*This freak type of schoolhouse gives improper lighting.*

*Heating and Ventilation.*—Open spaces and an abundance of fresh air, which are the rightful heritage of every child, are lost in many schools by improper heating and poor ventilation. This is a problem not always easily solved in rural communities, because few of the schools are cared for by janitors, equipment is old or poor, and without proper help it is difficult to keep fires going twenty-four hours a day in winter.

Much depends on the personal interest and knowledge of individual teachers. Once I very mildly called the attention of a rather elderly and somewhat ascetic teacher to the oppresively high temperature of her classroom. "Oh! yes," she said, "I like it that way." Despite the individual preference of this teacher, it is quite certain that the children, most of whom were wearing heavy clothing because of the long distances they had to come through the cold, were far from comfortable and were not in a receptive mood for instruction.

The temperature of the classroom should not be more than from 68 to 70 F. In the one-room and two-room school houses this is best secured and maintained by the use of jacketed stoves provided with fresh air intakes and ventilating ducts.

It is not possible to ventilate small schools satisfactorily by mechanical devices unless the windows are kept open part of the time, especially during the intermission periods. It is not enough for the teacher to see that the windows are open; she has to see that the fresh air intake connected with the jacketed stove does not serve as a catch-all for the remains of lunches.

*Daylight Illumination.*—One of the worst faults of many of the older school buildings in rural districts, and even in some of the modern buildings, is the defective lighting. The solution of this problem requires the assistance of technical advisers. It is not surprising, therefore, to find almost every fault known to the engineer in some isolated school buildings, because in so many instances they represent the architectural knowledge of the village carpenter. It is now quite generally believed that daylight should be admitted to the classroom from one side only, to the left of the seated pupils, and that the glass area of the window space should be about from one fourth to one fifth the area of the floor space. Excellent lighting may be secured by windows placed high up in the walls on two or three sides of the room.

Recently I came upon an excellent example of the result of lack of knowledge on the part of the teacher. In a consolidated school that had been constructed with commendable attention to school hygiene, the children in one classroom were seated with their backs to windows. On inquiry, the teacher said that she had read a book on school hygiene that stated that the children should be seated with the light coming from the left side, and under no circumstances should they be seated with the source of light to the right. In order to face the blackboards, which were peculiarly arranged in this classroom, the children had to be seated either with their backs to the light or with the light coming from the right side. This was another case of "a little knowledge is a dangerous thing," because the shadow cast on a desk by a child with its back to the light reduced the illumination by fifteen foot candles, which must have caused considerable eyestrain on dark days. It is just as essential to comfort to provide against too much as against too little illumination. Opaque and translucent window shades adjustable from both the top and the

bottom of the window may be used. The teacher has to give her careful attention to their adjustment. Shades drawn to exclude direct sunshine are often carelessly left drawn when the light is so subdued that all the pupils are seated in shadow.

The proper tinting of the classroom walls also has an important bearing on the illumination of the classroom. As a general rule, the ceilings may be tinted white or a light cream and the side walls tan or light gray or green. In one county the commissioners had evidently heard that green was easy on the eyes and, as a result, the walls and ceiling of a large number of the classrooms in the county had been painted so dark a shade of green that in time it became almost black.

Many old school buildings can be improved at a relatively small cost by blocking improperly placed windows, adding enough windows to provide for lighting from one side, fitting shades to shut out excessive sunshine and to regulate the amount of light admitted to the classrooms, and spending relatively small sums for painting the walls in soft colors.

### Medical Inspection

A sanitary school environment, although essential, will not keep the children in health unless it is supplemented by medical inspection, health teaching, training in health habits, and courses in physical training.

Many of the physical defects of adults developed in childhood when they could, as a rule, have been corrected. Although great

*Probably built by the first settlers—and still in use.*

advances are being made in some states and in some isolated communities, large numbers of country children are not properly cared for in this respect. At present the children of the country seem to be stronger than the children of the city, but, under existing conditions, the city children are moving ahead because of the better health supervision in the city schools.

### Defects in Country and City Children

It is often remarked that city school children have fewer defects than country children. It is doubtful whether there is sufficient evidence to make possible such a comparison because few country communities have had school medical inspection, and even now such inspections are usually made—when made at all—by persons without special training for,

*A consolidated rural schoolhouse of the type being erected in many communities.*

and with little interest in, such work. By far the greatest handicap in comparing the physical defects in city and country children, however, is the lack of uniform standards of school medical inspection. This makes it difficult to judge whether the inspection is equally thorough and the recorded defects of the same significance in various communities. For instance, the term "defective vision" may include a diminution of vision so slight that it is insignificant and probably would have been passed without record by an examiner of training and experience.

It is one of the paradoxes of the present methods of medical inspection that the percentages of physical defects, with the exception of defective vision, diminish progressively in the older children. Probably a large number of the recorded defects are so slight that the children recover naturally as they grow older. In addition, in the country schools the number of children in the primary grades in comparison with those in the higher grades is relatively much greater than in city schools. As a result, the percentage of physical defects in country school children is much higher than it would be if more of the older children were included in the examinations.

Significant physical defects among country school children are potentially more serious than similar defects among city children. This is due to the limited medical facilities of most rural communities, the inaccessibility to specialists, and in part to the children's poor environment. For example, the large number of dental defects among rural men in the draft as compared with the urban rate may

largely be accounted for by the inadequacy of dental facilities in rural communities. Among the most important child health activities of the Public Health Service is the work of the unit that attempts to solve the problem of dental neglect in rural and semirural communities.

For another reason, many of the recruits from rural districts were found to have defec-

*Surely a cheerless outlook for small boys and girls.*

tive vision, despite the fact that persons living and working under conditions requiring visual concentration, as in office positions, suffer from impairment of vision in larger numbers than persons living in the country. The faulty classroom illumination in the rural schools was largely the cause of much defective vision of rural recruits. Measurements of the desk illumination in one consolidated school on a cloudy day showed that the illumination of one half of the desks in some of the classrooms was less than 50 per cent. of the allowable minimum standard. Eyestrain and increasing near-sightedness result. The illumination of these classrooms could have been doubled by the proper tinting of walls, ceiling, and woodwork. The school authorities in this school, as in many other rural districts, had not sought or been given advice on the subject. Furthermore, officers of the Public Health Service, in the course of their work, have found many country children wearing glasses entirely unsuited to them. In most of such unfortunate cases, there was a difference in the vision of the two eyes and the children, because of the distance to the city, were required to rely on the services of a traveling "eye doctor" and to send glasses for repair to the distant city.

In many rural schools the percentage of children who have been operated on for diseased tonsils and adenoids is so small as to be almost negligible. In the cases in which operations have been performed the results are probably worse than the original condition, because of unskilled surgical technic. Diseased tonsils and adenoids are dangerous to the child's general health and they are potentially dangerous to hearing. Lack of treatment is one striking illustration of the health hazards imposed on the rural school child by reason of social and economic conditions. One state board of health, a few years ago, organized a tonsil and adenoid clinic to travel to isolated communities. This has given the benefit of skilled surgical attention to the thousands of rural school children in that state.

### Endemic Diseases

The educational facilities provided by a community may be considered an index of community culture and prosperity. Similarly, the sanitary conveniences in the homes and in the schools may be considered a measure of community interest in, and knowledge of, health essentials. Investigations have shown that a large proportion of the sickness and loss in economic efficiency in country districts is due to prevailing endemic diseases, such as malaria, hookworm, trachoma, and indeed typhoid fever, which is now largely a disease of rural communities. The importance of health supervision in the schools and the teaching of health habits and the inculcating of health principles on a community-wide basis can hardly be overestimated in the control of such diseases. It is a well known fact that the longer a habit is persisted in the more difficult it is to overcome it. In many of these districts the harmful conditions cannot be controlled except through the education of the rising generation, because the men and women who have lived for years in such surroundings

*A tooth brush drill.*

are fixed in their habits of thought and living and are not to be converted to new ideas.

### Communicable Diseases

Common infectious diseases of childhood travel fast in the country school because it is the point of most intimate community con-

tact. Aside from the effect of these diseases on the life and health of the children of a community, their prevalence, through want of medical supervision, is a serious economic loss. A recent compilation made by the United States Public Health Service is proof of this. It was found that 6,099 school children attending semirural schools, practically without medical supervision, lost through sickness 37,153 days from a possible 666,449 days of school attendance; a large part of this might have been prevented by adequate school health supervision. Besides the handicap of uncorrected physical defects and undue loss of time at school from preventable diseases, the rural child is at a serious disadvantage because of the shortness of the average school term. The average school term in city schools is one hundred and eighty-two days; in rural schools it is less than one hundred and thirty-seven days. Furthermore, almost 79 per cent. of the children of the city school attend daily, while in the rural school, with a term more than two months shorter, the average daily attendance is less than 71 per cent. of the enrollment.

*A lesson in dental hygiene.*

### The Remedy

Improvement in rural school hygiene will of necessity be gradual. The responsibility should be shared by both educational and health authorities. The teacher and the school should be potent aids to the health officer in teaching by precept and by example.

A few states already prescribe courses in health and hygiene for teachers and prospective teachers, and demand proficiency in selected health subjects as a requisite for a teacher's certificate, the guarantee of their preparation to teach health. Several states require teachers to make certain physical examinations. Obviously, they should receive some training for this important work.

More and more states are providing for physical training in the schools, including those in rural districts. The physical tasks required of so many country children cannot be considered exercise, but rather work without incentive. Physical training through active play will contribute greatly to the physical fitness of country children.

Teacherages, as a part of the school plant in rural districts, will enable the educational authorities to secure and retain the services of well qualified teachers and thereby advance health education.

Other logical steps to be taken in school health work in rural districts are:

1. The abolition of school districts and the establishment of county units of school admin-

istration. Unless this is done, it will not be easy to effect the second—an important step.

2. The consolidation of rural schools. By this measure, it will be feasible to do away with unhygienic one-room and two-room schools and assemble larger numbers of children in schools built according to modern views of school sanitation that make it possible and economical to maintain better health supervision. Automobiles and good roads contribute greatly to the growing tendency to rural school consolidation.

3. The organization of full-time county health units, with at least a health officer, a sanitary inspector, and one or more public health nurses. Because of the intimate association between the school and the home, the county health officer should gain a more intimate knowledge of health conditions in his district if he were acting as school physician than by any other method; he would be in a position to institute prompt and effective measures for the control of communicable diseases that are responsible for so many of the hampering physical conditions observed among school children. Although the public nursing movement has expanded rapidly in rural districts, the work of these important aids will not be completely effective unless it is included in the general health program of the community. No system of school health supervision will be fruitful unless it includes the services of a competent school physician and of qualified school nurses to assist in the medical inspection, to visit homes and inform parents of the serious consequences of neglect of certain physical defects and impaired nutrition in children, and to spread information on home hygiene.

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# *Messmates in the Human Body. III*

ASA C. CHANDLER

SOME years ago I had an opportunity to examine a young man who had been ill for a year or more. He moved about in a languid manner, was hollow cheeked, had lusterless, tired eyes, and a deathlike, grayish pallor indicating that his blood was in a seriously depleted condition. He believed that he was a victim of tuberculosis. He was exceedingly weak and complained of exhaustion after moderate exercise. He was restless and could not sleep well at night and was subject to headaches, occasional epileptic fits, dizziness, attacks of extreme melancholy, and other nervous symptoms.

*"The person with a tapeworm, after reading that paper, must feel like a zoo," remarked one man on reading this third installment of Dr. Chandler's series. The moral of this account of the adventures of some of the tapeworms that infest man is: If you have proper regard for health in general, you need never worry about worms.*

This young man's general appearance at once suggested hookworm infestation, but he had not lived in a place where he would have been likely to become infested with these dangerous parasites. I determined to find out, however, whether he could possibly be harboring in his intestine these or any other unwelcome guests. When, the following day, he brought a sample of feces for examination it required only two or three minutes with a microscope to find abundant eggs of a fish tapeworm, so called because infestation comes from eating improperly cooked fish. The administration of a drug to stupefy and drive out the worm resulted in the evacuation of a monstrous tapeworm which, when pieced together, measured nearly twenty feet in length and nearly an inch in width. Two weeks later the man came to see me again and looked and acted like a different person. His step was more active, his eyes brighter, and he had regained a healthy color and more than ten pounds in weight. Such an instance leaves little ground for the popular opinion that a tapeworm is to be looked on as more or less of a joke, and as such to be got out of the system, but not to be taken seriously.

It is not to be inferred that infestations with tapeworm are always as sinister in their effects as in this case. In many persons, as a matter of fact, tapeworms may be harbored for a long time without producing sufficient symptoms to cause suspicion that something is wrong. Probably a person who is furnishing shelter and daily food to tapeworms can never enjoy as good health as he would if free from his guests, but nervous symptoms, a somewhat increased appetite accompanied by a failure to increase in weight, or by a loss of weight, and a moderate loss of ambition and "pep"

are usually accepted by mankind as among the necessary vicissitudes of life, without a realization that in many if not most instances the underlying cause of "not feeling so well" can be determined and corrected.

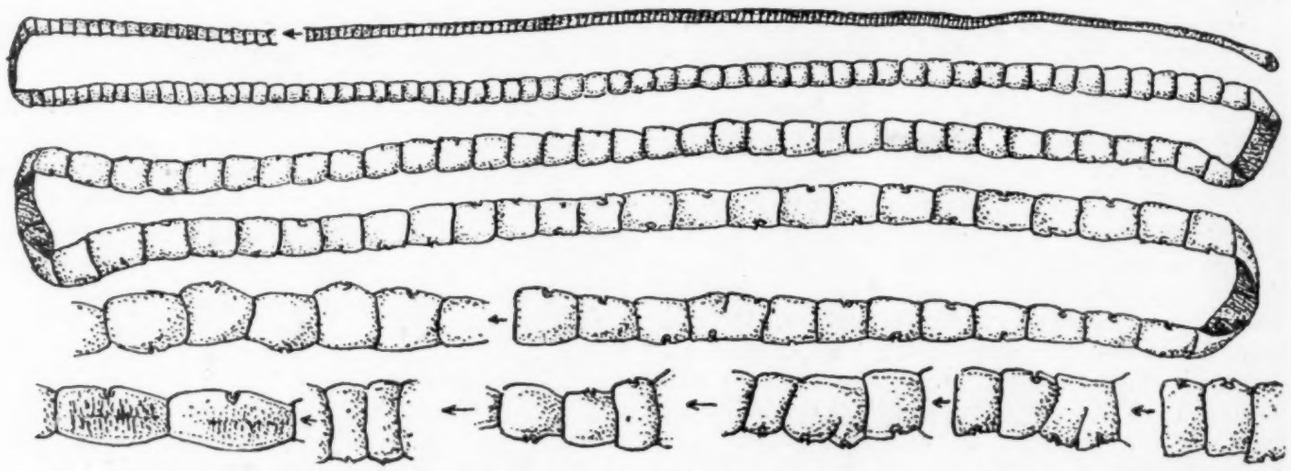
### The Biography of a Tapeworm

Tapeworms are certainly among the most bizarre animals that nature has ever produced. It is difficult to imagine a more weird creature than a worm, many feet in length, consisting of hundreds and often thousands of segments, each of which is, to all intents and purposes, an individual in one huge and ever increasing family. The forefather of the entire family, in almost all kinds of tapeworms, develops from the egg in a different kind of animal from that in which the worm finally reaches maturity, and is usually protected by a bladder-like structure from which it gets the popular name bladder worm. The forefather is what is popularly called the head of the worm; certainly it is the head of the family. This "head" is provided with powerful cuplike suckers, somewhat like the suckers on an octopus' arms, for attaching itself to the wall of its host's intestine; in many kinds of tapeworms the suckers are assisted by diabolical thorn-shaped hooks.

The "head" grows out into a neck almost immediately after establishing a residence in the host's intestine, and, as the neck grows, its terminal portion becomes separated by a constriction, and thus the first segment is produced. A few hours later another segment is marked off from the neck, pushing the first one farther away from the head, and this process continues until, in some kinds of tapeworms, a chain of several thousand segments is formed. As the segments grow older and are pushed farther and farther back by the younger segments, they continue to increase in size until a maximum is reached, and the internal organs gradually develop, as they do in an embryo. Each segment functions as an individual, complete in itself, dependent on the parent worm only for attachment to the host. There are, in fact, some tapeworms in which the segments actually become separated from the parent before maturity and finish their development as independent organisms.

### The Lazy Life of This Parasite

A tapeworm is an excellent example of the effect of a parasitic life. Securely attached to the wall of a host's intestine, a tapeworm is entirely free from predaceous enemies; it has, in fact, less to worry about as regards enemies than any other animal except a skunk. Furthermore, being constantly bathed in digested foods, it not only does not have to seek for food, but doesn't even have to digest it. It merely hangs on to its host and absorbs predigested foods through its skin, thus doing away with the necessity for even a vestige of a digestive system; it has no mouth, stomach, or intestine. Why go to the trouble of digesting food when the obliging host will do it? Sight, hearing, taste, and smell would be useless sensations to such a creature, and so are lost according to one of the inevitable laws of nature, that when her gifts are not utilized they are withdrawn. Only a crude sense of touch is left of the rich gifts of sensation with which nature has endowed such of her children as have been willing to use them.



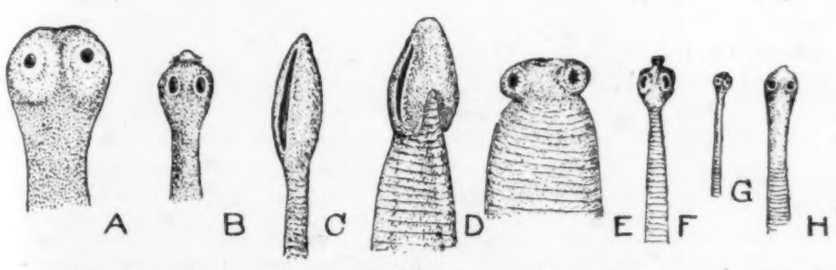
*These are pieces of the beef tapeworm (Taenia saginata), natural size, from various parts of the body. The head is small and the neck slender; the segments gradually increase in size; toward the end of the worm they are shaped like pumpkin seeds.* *(After Stiles. From Chandler. Courtesy of Wiley and Sons.)*

### Maintaining the Family

But simple as a tapeworm's life may seem from the standpoint of individual safety and of food, one problem, that of reproduction and safe establishment of the offspring in other suitable hosts, presents great difficulties. To insure the safe establishment of a single off-

spring, generation after generaton, to perpetuate the race, a tapeworm has to produce not hundreds, or thousands, but millions of eggs. Each segment, in a chain containing hundreds or thousands of them, has a fully complete male and female reproductive system, each one of which produces many hundreds of eggs. There are some species of tapeworms each segment of which has two complete male and female systems. In the absence of more than one tapeworm, the segments mate with each other, and sometimes are said even to fertilize themselves. After fertilization, each segment becomes a mere living machine for the perfection of the eggs. The cavity or tube into which the eggs are passed after fertilization, known as the uterus, becomes so distended with the developing eggs that it eventually comes to occupy almost the entire segment, pushing aside or absorbing nearly all the other organs. In most tapeworms, such "ripe" segments, which are then little more than egg-filled sacks, drop off from the end of the chain, sometimes two or three together, and pass out into the great wide and unfriendly world to die for the sake of the race, since it is only by the disintegration of the mother segment that the embryos, already developed inside the egg shells, can be liberated and get an opportunity to fulfil their destiny.

The embryos, protected by the very resistant egg shells, must depend on good fortune for their salvation, since in most tapeworms they have no power to help themselves by seeking a host in which to pursue their adventurous lives. Scattered by surface water, flies, burrowing insects, dust, or mechanical means, they await the chance of being eaten by a host in which they are capable of development. Each different species of tapeworm must be nursed to the bladder worm stage by a different intermediate host, and, with the exception of the dwarf tapeworm, the bladder worm stage must be developed in a different individual, and in nearly all cases an entirely different kind of an animal from that in which the final mature tapeworm is found.




*These heads of some of the adult tapeworms found in man are drawn about 10 times natural size. A, beef tapeworm; B, pork tapeworm; C, fish tapeworm; D, heart-headed tapeworm; E, African tapeworm; F, double-pored dog tapeworm; G, dwarf tapeworm; H, rat tapeworm.* *(From Chandler. Courtesy of Wiley and Sons.)*

### Make the Acquaintance of the Beef Tapeworm

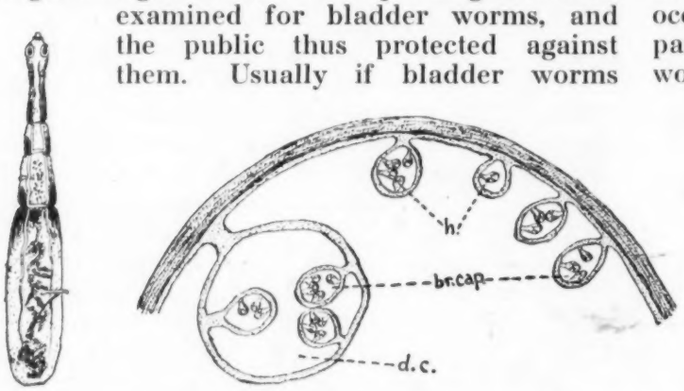
Probably the tapeworm that is best known in this country is the large beef tapeworm. This parasite reaches a length of at least fifteen or twenty feet; there are reports of tapeworms of this species measuring thirty-five or forty feet, but it is likely that most of these specimens were measured after the pieces of more than one worm had been combined inadvertently. This worm does not have thorns on its head. The terminal "ripe" segments are shaped like pumpkin seeds and reach a length of about three fourths of an inch. The eggs of this worm when eaten by cattle develop in the flesh into yellowish bladder worms about a third of an inch long, and produce the disease in cattle known as "measles." When measly beef is eaten without thorough cooking, the head of the tapeworm, inverted into its bladder, comes out, attaches itself to the human intestine, and generates a complete worm in three or four months.

*The bladder worm stage of the pork tapeworm, as found in measly pork, with the head protruding.*
*(Partly after Stiles. From Chandler. Courtesy of Wiley and Sons.)*

### Meet the Pork Tapeworm

The pork tapeworm is similar to the beef tapeworm but is a little smaller and has a crown of thornlike hooks on its head. The eggs of this species develop into bladder worms, most commonly in the muscles of hogs, but are capable of development in some other animals, including man. This fact makes this worm much more dangerous than its beef-loving cousin, since, as sometimes happens, if an egg-filled segment gets back into the stomach of its host, the eggs are set free, the embryos are liberated, and they penetrate into the tissues and organs of the unfortunate host, to develop into bladder worms. A few of the latter in the muscles would be a matter of little moment, but the embryos have the undesirable habit, when developing in man, of coming to rest in such delicate organs as the eye and brain, and may then cause serious effects. Therefore, however little damage a pork tapeworm may do as an adult in the intestine, it is a source of great potential danger. In spite of the fact that "measles" in hogs is rather common in the United States, records of the occurrence of the adult worms in man are fortunately rare. This fact is due partly to the present system of

government inspection of meat, worked out by the United States Bureau of Animal Industry, by which the meat of all cattle and hogs in the larger slaughter houses and packing houses is examined for bladder worms, and the public thus protected against them. Usually if bladder worms




*To the left, the adult Echinococcus granulosus, found in the intestine of a dog, magnified 10 times.* (After Luckhart.)

*To the right, diagram of a portion of a small hydatid (echinococcus) cyst, magnified about 5 times, with daughter cyst (d.c.), brood capsules (br. cap.), and retracted heads (h.).* (From Chandler. Courtesy of Wiley and Sons.)

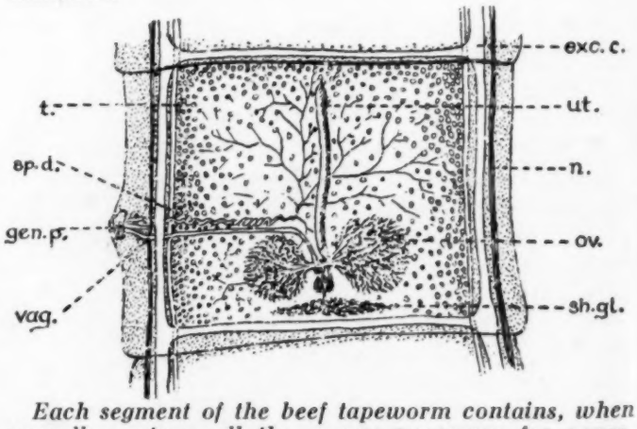
are present, they are numerous enough so that a brief inspection of some of the muscles known to be particularly attractive to them demonstrates their presence. The degree of infestation of hogs by bladder worms sometimes is so great as to tax one's credulity. Dr. M. C. Hall, for instance, has recorded a case of pork "measles" in which the bladder worms were estimated to constitute one-half the weight of the meat of the animal, and must have been more than 200,000 in number.

### In Numbers there Is Strength

The dwarf tapeworm is the most common species found in man, although it is not nearly so well known, even to physicians, as the larger species. It reaches only a fraction of an inch in length and is so delicate and transparent that it looks like a strand of mucus in the feces and is difficult to find even when many of them have been evacuated. This worm makes up for its small size by its numbers; it is sometimes present in the intestine by thousands. Unlike any other tapeworm, except a few closely related species in other animals, this worm can complete its entire development from egg to adult in a single host. In its bladder worm stage it develops in the tiny pockets in the walls of the intestine. Later these larvae fall into the cavity of the intestine, the heads attach themselves, and the adults develop. This species also occurs in rats and mice, and it is possible that human infestation may come from eating uncooked cereals or other foods contaminated by rat or mouse feces containing the eggs; it probably develops more often, however, by contamination of food or water with eggs of human origin. Between 1 and 2 per cent. of children in our southern states harbor this species of tapeworm. Another species related to the dwarf tapeworm but much larger, being a foot or more in length, also is found occasionally in man, but it is normally a rat parasite. Its larval stage develops in meal worms, rat fleas, and other insects that are eaten by rats, and human infestation must come from eating uncooked cereals, dried fruits, or other foods containing the infested meal worms.

### The Fish Tapeworm Thirty Feet Long

The fish tapeworm, which was mentioned at the beginning of this paper, is of rather rare occurrence in this country, but it is important because of the unusually severe symptoms which accompany its presence. It is the largest tapeworm found in man, and reaches a length of thirty feet. It differs from other human tapeworms in its life history. Instead of passively waiting to be eaten by an intermediate host, the embryos of this species slip out of their egg shells in water and roll about by means of the lashing of little hair-like processes all over their surfaces, like miniature chestnut burs. Water fleas, attracted by these tiny rolling objects, pursue and devour them; a certain degree of development is attained by the embryos in the bodies of the fleas. When the water fleas in turn are devoured by fish of various kinds, the little freed larvae penetrate the intestinal walls of the fish and imbed themselves in the muscles. And the fish, at last, must be eaten by a man, or dog, or other suitable final host, before the adult tapeworm stage can be reached. Little wonder with such a series of adventures ahead of them before they reach maturity that a tapeworm's offspring should be numbered in millions.

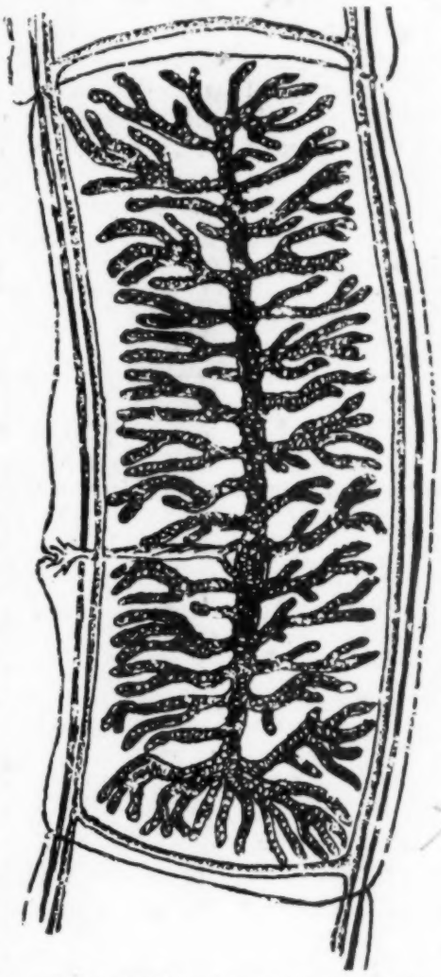



*Each segment of the beef tapeworm contains, when sexually mature, all the organs necessary for reproduction. In this drawing, which shows the segment about 7 times natural size, the abbreviations represent the portions of the segment as follows: exc.c., excretory canal; n., nerve cord; ut., uterus; ov., ovary; sh.gl., shell gland, usually called yolk gland; vag., vagina; gen.p., genital pore; sp.d., sperm duct; t., testis.*

(Partly after Leuckart. From Chandler. Courtesy of Wiley and Sons.)

### The Echinococcus Cyst an Ancestral Home

There is one other tapeworm that has to be reckoned with seriously by man, a species that utilizes the human body for its larval development, but reaches its adult stage in dogs. As a rule, adult tapeworms are very much larger than the larval stages, but in this instance the situation is reversed. The adult, which is called *Echinococcus,* is one of the smallest tapeworms known, and is little more than an eighth of an inch in total length, consisting of the head and only two or three segments. These minute, almost microscopic worms exist in the intestines of dogs, usually in thousands. As new segments are developed, the ripe ones constantly fall off from the ends of the worms, and leave the body of the dog with the droppings. The normal course of events is for an occasional one of these egg-filled segments, scattered over pastures by the dogs, to be eaten accidentally by sheep or cattle. When this happens the embryos are as usual liberated from the eggs, they burrow through the intestinal wall of the new host, and go merrily on their way to the liver, spleen, lungs, or other internal organs. Having safely arrived at this destination, they settle down to the business of growing. The exceedingly minute embryos, absolutely invisible to the naked eye, grow in a month's time to about the diameter of pin heads, and in five months develop into hollow bladders about as large as walnuts. Meanwhile little buds grow out on the inner surface of the bladder and become hollow secondary bladders called brood capsules. In these little brood capsules other buds are formed and develop into minute heads. The bladder, which is now known as a hydatid cyst, continues to grow until it becomes as large as a tennis ball, and occasionally as large as a good-sized grape fruit; it may contain large numbers of brood capsules and thousands of heads, each of which is capable of developing into an adult worm if eaten by a dog.



*After fertilization the uterus in each segment of the beef tapeworm becomes greatly distended by the rapidly forming eggs and occupies almost the entire segment, here shown about 7 times natural size.*

*(After Stiles. From Chandler. Courtesy of Wiley and Sons.)*

The same kind of development takes place in a human being who is so unfortunate as to swallow any of the eggs. This might seem a rather improbable accident, but it can happen rather easily when too great familiarity with dogs is tolerated. In Iceland, where the disease is especially prevalent, dogs are allowed unbounded liberty in playing with children, "kissing" them and licking their faces, and even, sometimes, eating from the same dish as their human companions. The unclean habits of all dogs readily leads to the presence of eggs in their mouths, and any direct or indirect contact between a dog's tongue and a human mouth is all that is necessary to make possible the planting of seed on fertile ground to develop into most undesirable fruit. Certainly too great intimacy between dogs and children should never be tolerated by parents, no matter how beloved the dog may be, for even if *Echinococcus* is not present, there are other infections that are transferrable in this way from dogs to man.

### Keeping Away from Tapeworms

From this brief summary of the tapeworms that find happy hunting grounds in the human body, it is evident that the procedure required to lock the door against these undesirable guests varies with the various species, but the following of a few simple "don'ts" would result in making human infestation by tapeworms so rare that in a few years such a case would merit widespread newspaper publicity. Practically all of these "don'ts" condemn habits and customs followed only by the uncleanly or thoughtless, and the thoughtless we have always with us.

Don't eat raw or imperfectly cooked pork, beef, or fish.
Don't eat uncooked foods that contain meal worms.
Don't allow children to eat with unclean hands.
Don't tolerate rats or mice in the pantry.
Don't allow intimacy between dogs and human beings, especially children, and never allow a dog to lick a human face.
Don't feed dogs on the entrails of slaughtered sheep or cattle.
Don't allow cattle or hogs access to human feces.

# A Layman's Comment on Some Recent Books on Health

HARRY HANSEN

WHEN the layman approaches books in the field of medicine, he is likely to find most interesting those that have some relation to his own particular whims or ailments, and to regard most favorably those that flatter his knowledge of himself. True, there are books that may interest him without their having a specific application to the state of his health, as witness a splendid volume, "Paleopathology" by Dr. Roy L. Moodie of the University of Illinois, in which the author diagnoses various structural ailments from evidence contained in fossil remains of monsters dead and gone these millions of years. But even here the layman reads differently than does the physician; he is interested in the dinosaurs, monosaurs, and other prehistoric mammals for themselves, whereas the physician studies evidence of callus, fractures, arthritis, infection, and opisthotonos in their remains. But by far the greater reading by the layman is among those books that tell the fat how to reduce and the lean how to acquire symmetry, and the rest of us how to prolong life. Too much reading in these books may have an unfortunate effect; the layman may find that physicians differ as much in print as verbally, and finally he may get so confused at the various menus and dietary regulations as to determine to eat what he wants when he wants it, if it kills him.

*The value of a book on health is not measured by its meaning to the medical man alone, but also to the layman. In this paper Mr. Harry Hansen, literary editor and critic for the Chicago Daily News and Harper's, has given his impressions of six recent health books. Three of these have been given brief notices in* HYGEIA. *Following each discussion by Mr. Hansen is a brief consideration of the book by Dr. Morris Fishbein. This is the first time, so far as we know, that books on health have been submitted to such joint review. It is an attempt to arrive at an estimate of the extent to which such books fulfil their purpose.*

[Mr. Hansen will find that well trained, competent physicians differ little in print on advice to the public in matters of health and hygiene. Neither do they differ greatly in advice regarding menus and dietary regulations. Unfortunately, much of such advice is given by writers who have not been properly qualified in the fields in which they attempt to advise or who are unable to distinguish that actually proved from that which is merely opinion. Medicine, in so far as it has reached the stage of a science, is as exact as any science. The difficulty comes in determining what is really established.—M. F.]

THE PATIENT'S VIEWPOINT: By Paluel J. Flagg, M.D. Cloth. Price, $1.30. Pp. 182. Milwaukee. Bruce Publishing Company. 1923.

The task that confronts me is to take these half dozen books that have come to my desk and give them a valuation from the basis of my reading as a layman. And that shows me that although I might review a work of literature in the light of all that I had read before, and with an objectivity gained through years of careful study, I somehow cannot read these books on medical subjects without recalling my own recent indigestion and my child's measles. Nor can I shut myself wholly out of sympathy with a physician who, like Dr. Paluel J. Flagg, in his book called "The Patient's Viewpoint," castigates the profession for certain glaring errors. The layman has heard so much about doctors treating too many cases in a day, about partiality toward rich patients and carelessness in public dispensaries, about obstetric operations clumsily performed by inexperienced interns and men hardly out of college, about arrogance on the part of successful physicians and the tendency of specialists to diagnose every ailment in terms of their own specialty, that from first to last he is led to believe that Dr. Flagg must be speaking from an inside knowledge of these flagrant abuses. Dr. Flagg finds physicians concentrating all their attention on the disease, to the exclusion of the patient, and feels that an unwise emphasis on research and laboratory methods is driving the patients "to the exponents of the various pathies." Of that I have no doubt. I am often reminded that there are members in the Christian Science church who received their first inclination to join from witnessing a gross error by an inexperienced physician, and the layman who is once disillusioned about the sacred character of the doctor's work is very apt to generalize and include all doctors in his denunciation. Dr. Flagg, I find, has directed attention to certain abuses within the profession, for instance:

A lack of respect for the human body, caused by excessive familiarity with it.

Speed in operations, due to the fact that the physician's time in the operating room is limited and another surgeon is waiting his turn. Dr. Flagg shows how this militates against a prolonged operation when one is indicated.

Inexperience among assistants—how an uncertain anesthetist may cause a fatal termination.

Imperfect hospital technic, carrying with it death and destruction. "The standardization of hospital technic for the protection of the public is of infinitely greater worth than the addition of new furniture and rooms."

Partiality among physicians to patients of culture and means; the difference between the treatment of the ward and of the private case.

Abuse of the specialist's function; over-specialization which loses sight of the patient in the "case." Experimentation with the human body.

Discourteous treatment of nurses by physicians, or unusual attention to a nurse by physicians, both demoralizing to an organization.

Dr. Flagg has a remedy at hand; it is to build up an appreciation of the spiritual nature of man and so create respect for his physical mold. To do this he gives his views on evolution and on the differentiation of man from animals, and because he finds that man has a soul and that animals have not, he infers that evolution cannot account for man and that therefore man must have been "created." Into this realm of theological discussion I cannot follow him, but if emphasis upon man's spiritual side will help overcome grave abuses in the medical profession few laymen would be averse to seeing it tried.

[In recommending that physicians concentrate more on the patient and less on the disease, Dr. Flagg follows the attitude adopted by all teachers of medicine. It is unfortunate that in his opening chapter he gives a picture of the dissecting room of many years ago with its careless unscientific atmosphere, and not of the modern dissecting room that is a research laboratory of the highest type. Again, in his discussion of the spiritual side of man's life, Dr. Flagg fails to differentiate between that which is known and that which is merely believed. The attempt to reconcile religion with science is as old as science and religion themselves. Thus far, even with the aid of Dr. Flagg, it is apparently not wholly successful. One must keep ever in mind the definition of science as that which is known and proved. The appeal of Dr. Flagg for a higher culture for physicians and for more general practitioners is thoroughly in accord with the trend of the best modern medical thought.—M. F.]

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NURSERY GUIDE FOR MOTHERS AND NURSES: By Louis W. Sauer, M.D., Senior Attending Pediatrician, Evanston Hospital. Cloth. Price. $1.75. Pp. 188, with 12 illustrations. St. Louis. C. V. Mosby Company. 1923.

Dr. Louis W. Sauer's little book, "Nursery Guide," has an unusual interest for me, for Dr. Sauer has lately looked down the throat of my daughter. If this book reveals any of the knowledge with which Dr. Sauer is equipped, it should get a warm welcome. It possesses the merit of brevity, of terse statement; Dr. Sauer does not discuss the pro and con of a case, but gives his decision. This method appears to have satisfied mothers in the past, for Dr. Holt is brief and to the point, and therefore easy to follow. Dr. Lena Sadler's book, "The Mother and the Child," which stands next to Holt in my library, is more discursive, but I might add that most persons prefer a discussion of cases, for children cannot all be entered under a few heads and many of us believe that what is good for one is not necessarily good for another. But Dr. Sauer prescribes specifically. You either follow the Sauer method, or you don't. For instance, he writes on the subject of measles:

> By injecting into a young child within four days after exposure 5 c.c. or more of blood serum from a child who has completely recovered, the disease can be prevented. When children between five months and three years have been exposed, they should whenever possible receive this prophylactic treatment sufficiently early.

Nothing is said by Dr. Sauer of the fact that many physicians do not advise this serum treatment—if you follow the Sauer book you follow the Sauer method, that is all. I should say that the book is comprehensive and useful; no doubt every line in it is based on personal observation of the result of the author's advice.

[Mr. Hansen has placed his finger on one of the most important points in medical advice when he says, "You either follow the Sauer method or you don't." It has long been the custom for physicians to tell patients didactically the course of procedure to be followed and for the patients to follow or not, without a clear understanding of the reason for the action. However, it is the modern method—and it is in accord with this that HYGEIA was established—to explain to patients the reasons for certain medical procedures in order that the patients may follow them more intelligently. For this reason the booklet of Dr. Sauer is subject to the criticism that it is rather too brief. For instance, he says "Breathing bad air even for a few hours is harmful," but there is nothing in the book to explain what bad air is or why it is harmful, except a brief paragraph on dry air. (See, in this connection, "The Relation of Air to Health," by Robert F. Jones, in HYGEIA for September.) In one section, "Common Ailments," Dr. Sauer goes somewhat further than is commonly believed to be desirable in his prescriptions for the treatment of disease, in that he suggests self medication with drugs as powerful as antipyrine. He appears somewhat too positive in stating that measles can be prevented by injecting the child with 5 c.c. of serum from a patient who has recovered from the disease. The method has not been sufficiently accepted to warrant routine use. It should be undertaken on the advice of the attending physician, and it should not be urged against his advice. On the whole, however, the book by Dr. Sauer is a well considered, simply stated manual, and with the minor exceptions mentioned, wholly reliable.—M. F.]

ENVIRONMENT AND RESISTANCE IN TUBERCULOSIS: By Allen K. Krause, A.M., M.D., Associate Professor of Medicine, Johns Hopkins University. Cloth. Price, $1.50. Pp. 137. Baltimore. Williams and Wilkins Company. 1923.

In "Rest and Other Things," the layman encounters a clear discussion of how to avoid tuberculosis by Dr. Allen K. Krause. This is a subject that is always before everyone's eyes, and if the book has something valuable to offer it should have a wide circulation. The first emphasis is on rest in the treatment of tuberculosis. This message is not new, but, as Dr. Krause says, until the time comes when every patient with tuberculosis knows that rest is the most important element in the treatment of his disease, it will need incessant reiteration. And rest, to Dr. Krause, does not mean that the business man with a spot on his lungs should merely give up dancing while continuing at his desk; he should have absolute rest and relief from strain. "The fatigue line is an individual affair registered only in the patient's own consciousness. The patient has his cure in his own hands."

Dr. Krause has little sympathy with treatment unless rest is absolute. "Of those who, while living an active life, relied on drugs or vapors or serums or vaccines to fight their battle few have made the journey back." The man with symptoms is to Dr. Krause a serious case; he "enters upon a battle for his life." Exercise has never helped the consumptive; rest is the only appetizer. Fresh air and good food he must have, but not exposure to the wearing and damaging influences of weather and climate, nor forced stuffing with milk and eggs beyond the demands of the appetite. That delays rather than hastens cure. In certain cases Dr. Krause advocates treatment by artificial pneumothorax (injection of air into the chest cavity), "the one effective weapon against advanced pulmonary tuberculosis." Dr. Krause has a chapter that sets forth that "indoor and direct contact hypotheses of tuberculous infection have been greatly overemphasized," that outdoor indirect infection, through sputum, makes up a large part of the total, and in children perhaps the greater part. He believes strongly in preventive methods for tuberculosis; he endorses the open air school as one of the best and believes it worthy of any amount of development. Children should be particularly guarded when they show infection of the eyes, rashes, or underweight. By treatment early, tuberculosis later in life can be avoided. There are discussions of other antituberculosis measures, programs for avoiding development of the disease, and a paper on the relation of the physician to the tuberculosis problem. In this Dr. Krause discusses the inadequate preparation of the general practitioner for the treatment of tuberculosis; the small time given the subject in medical colleges; the difficulty of getting able and enthusiastic teachers. "Only in medical schools connected with large general hospitals can we expect to come in touch, even approximately, with tuberculosis as a whole. . . . There is not a single medical school or university in this country which has shown itself fully alive to the possibilities of developing the scientific side of tuberculosis. There is not even a single adequate permanent foundation in tuberculosis. . . . I should say that in medical schools like those at Columbia, Harvard, Pennsylvania, Chicago, Johns Hopkins, and so forth, an adequate foundation would require resources netting $50,000 a year. With permanent tuberculosis foundations, investigators and teachers would soon spring up. This is the very heart of the problem of tuberculosis education." The lay reader who, because he has annually pasted tuberculosis stamps on envelopes at Christmastide, has a vague notion that the medical profession is engaged in an intensive, nation-wide study of tuberculosis and is equipped to devote its best energies to it, stands back aghast. Can it be that this great plague is given so little attention, that competent men cannot devote their lives to it because of inadequate remuneration and equipment? If so, a great campaign of education is an immediate need.

[Dr. Krause is a well known, authoritative writer on tuberculosis, both for physicians and the public. His book may be recommended to every intelligent person who is interested in tuberculosis. It is a consideration not only of rest, but also of every other form of treatment in tuberculosis. The address on sputum infection of children, which Mr. Hansen does not mention specifically, was prepared by Dr. Krause to read before a medical organization. It is doubtful that the average layman would read it understandingly since comprehension involves a considerable knowledge of both anatomy and the science of immunology.

Dr. Krause will probably be especially interested in the impression made on Mr. Hansen relative to the antituberculosis campaign. Actually the campaign has been remarkably successful in markedly lowering the death rate. The great question is whether or not tuberculosis can be completely eradicated as, for example, yellow fever has been, or reduced to the extent that typhoid has been. To accomplish such a result will require far more public cooperation than the purchasing and pasting of stamps.—M. F.]

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OVER WEIGHT? GUARD YOUR HEALTH: By Royal S. Copeland, M.D. Cloth. Price, $1.00. Pp. 122. New York. Cosmopolitan Book Corporation. 1922.

We now come to one of those books that have very little of the scientific about them and that appeal to a wide public. It is entitled "Over Weight? Guard Your Health," and is written by Royal S. Copeland, M.D., commissioner of health of New York City. The subtitle reads: "Among adults the overweights have a greater prospect of early death than the underweights." That alone

should be sufficient to make a purchaser out of every fat person who sees the book. One of the first sentences reads: "Your overweight is not important merely because it ruins your figure," from which we deduce that the book is addressed mainly to women, for men have not worried about their figures recently, at least not until white knickers began to be used on the golf links. In truth there are many appeals to the woman in this book, and Dr. Copeland has told in most elementary fashion about such factors in reducing as hot baths, exercise, and the avoidance of fatty foods, and has prescribed a list of menus for those desiring to reduce.

[The book by Dr. Copeland seems to be exactly what its publisher claims—"A common sense book for practical persons."—M. F.]

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WHAT TO EAT IN HEALTH AND DISEASE: By Benjamin Harrow, Ph.D., Associate in Physiological Chemistry, College of Physicians and Surgeons, Columbia University. Cloth. Price, $2.00. Pp. 203, with 17 illustrations. New York. E. P. Dutton Company. 1923.

"What to Eat in Health and Disease" is another guide to diet, but the name of Dr. Benjamin Harrow of Columbia university raises it in importance in the eyes of the layman. Dr. Harrow wrote "Vitamines," which has been widely read. The present book appears to be less a statement of his personal convictions than a summary of various dietary programs with a desire to get the beneficial elements out of each. The book is largely elementary and is not intended to stand alone as a guide; Dr. Harrow explains, in his chapter on infant feeding, that he expects it to supplement the work of the physician, who cannot always be present. He is an advocate of mother's milk the first year, and against prepared foods, which he says have an insidious way of working into the brain of man through advertising. His chapter on vegetarianism is a fair account of the nutrition to be gained from this practice; he agrees that there are few persons who follow a strictly vegetable diet, that most of them add milk and eggs, and that this has benefits, although they cannot be strictly measured. His chapters on overweight and constipation contain nothing new, but the information he offers may reach readers who have not profited by this advice heretofore. He discusses also faulty diet, digestive disorders, and diet in common diseases, and he describes the digestive organs for the benefit of the unprofessional reader—a book of information.

[The book by Benjamin Harrow seems to be largely a rewriting of material selected from medical literature. The material has been well chosen and forms an excellent guide to modern knowledge on the subject of diet. There is, however, too much pro and con discussion on matters not yet established.—M. F.]

THE OMNIPOTENT SELF. A STUDY IN SELF-DECEPTION AND SELF-CURE: By Paul Bousfield. Cloth. Price, $2.00. Pp. 183. New York. E. P. Dutton Company. 1923.

The merit of the book by Paul Bousfield of the London Neurological Clinic, "The Omnipotent Self," is that it tells in clear fashion something about the uses of psychanalytical methods without bringing sex into the discussion. Analysis of this kind has been greatly perverted in the minds of the public because of the sex factor. A great deal can be written about the unconscious mind, repressions, self-deception, narcissism, identification, and other subjects without bringing in analysis that has an erotic flavor. Dr. Bousfield found that patients suffering from shellshock are often good subjects for the study of the effect of repression. Most of his book is an inquiry into pride and self-love, and he comes to the conclusion that "narcissism is a normal thing in a newborn infant and the root of many virtues; but in its final adult form it must be sublimated and very much attenuated." A brief chapter is devoted to autosuggestion, but Dr. Bousfield does not commit himself to the Coué formula. The chapter is rather a discussion of the value of suggestion. He writes: "A great deal too much has been claimed for suggestion in recent months. Ordinary methods of suggestion are frequently merely directed to the cure of the symptom rather than the disease; in fact, such autosuggestion, popular as it has become, may frequently be likened to a doctor who treats smallpox by putting ointment on the spots or appendicitis by giving morphia." His method is to give the patient a thorough understanding of the underlying causes of his disability before he agrees to the patient's trying any suggestion on himself. The patient then, knowing what he has to do, is merely building up his determination to do so. One might call this either autosuggestion or character building. Dr. Bousfield applies it not to disease, but to character building, for it becomes an aid in overcoming those irritations and limitations that grow out of pride and self-love. If autosuggestion has any place at all in restoring poise to a person confused in mind, this would seem to be where it belongs.

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[The difficulty of teaching medicine to the uninformed is well covered by one of the first paragraphs in this book by Dr. Bousfield. "If one were to tell the ordinary laborer that water is composed of two gases which when combined form a liquid, he would probably be quite incredulous, and possibly in his ignorance might even deny emphatically any such possibility, on the grounds that it was against all common-sense and experience; he failing to realize, of course, how very limited were both his sense and his experience. In spite of his feelings of absolute certainty, and in spite of complete faith in the unshaken logic behind his belief, he would be wrong."

Dr. Bousfield's book represents a complete acceptance of Freudianism. In this it goes far beyond the limited extent to which the views of Freud have been accepted by physicians generally. For those wishing a Freudian view it will be found to be a good expository manuscript. It is unscientific in that it asserts didactically much which is not yet established. It should be axiomatic that articles on health for the public should be limited to that which is known and proved, and that when sufficient evidence does not exist positively to establish a conception, the writer should state frankly the fact that the evidence is not sufficient. With a lack of fundamental knowledge of anatomy and physiology and with practically no knowledge of pathology, abnormal conditions in the body, a lay reader is not competent to judge whether or not the statements made are warranted. He should not be regaled, therefore, with matters that are theoretic or in an experimental stage. Such discussions may well be limited to those who are able to comprehend and who cannot be harmed by being led to follow wrong advice.—M. F.]

# *The Future of Preventive Medicine*

JOHN E. ELMENDORF

IN the early days of medicine, when it was more an art than a science, attention was concentrated on its curative side, and naturally so, since sickness could not be foretold; actual signs and symptoms had to be present before measures were taken to arrest the conditions and lead the patient back to normal.

With the progress of scientific investigation of infection, it has now become possible, given certain conditions, to predict the outbreak of a disease. It is known, for example, that typhoid bacilli consumed with drinking water will produce typhoid fever in persons who are not immune. With knowledge of the spread of disease, has developed that brand of medicine which attempts to control the conditions and circumstances leading to disease.

*Preventive medicine is based largely on two principles, first, destroying the agent of the disease, and, second, preventing the onset of the disease by vaccination or immunization. The first method tends to blot out the malady; the second helps in the blotting-out process, but is particularly of benefit to individuals by giving them protection. The first is, of course, the ideal to be attained. The steps toward that ideal are here sketched by Dr. Elmendorf, of the International Health Board. The Board has carried on health work in many portions of the world.*

From the recognition of abnormal physical conditions, we progress to the knowledge of the causative agents. From this knowledge we advance to an understanding of the process of development of the infecting organism, and realize in many instances that prevention is possible. This absolute knowledge of prevention is the basis on which is founded the modern art of preventive medicine, which is closely interwoven with medical practice in all its phases.

Curative medicine, when successful, heals the individual and extends its benefits to thousands of the sick. Preventive medicine contains less of the dramatic element, does not appeal to the emotions, is read in the drab language of statistics—or is it that we read them drably! But preventive medicine is constantly safeguarding all those who may be subject to the disease in question. When successful, it cuts out disease from a community as though it were a cancerous growth.

To prevent a disease it is necessary to know its cycle of life and its manner of propagation and attack. The clearest way to demonstrate the truth of this principle is not by giving examples of diseases we now know how to prevent, such as typhoid, smallpox, or yellow fever, but by pointing out a conspicuous example of an infection regarding which the necessary facts are not known. We have not discovered the cycle of influenza, and influenza remains among us with its periodic ravages; it is impossible to do more than attempt a cure. It will remain impossible to ward off this disease until we better understand the factors involved in its latent stages, the method of its conveyance, and its mode of attack.

## Principles of Prevention

Preventive medicine is based largely on two principles. The first, and by far the most important principle from a general standpoint, is that of breaking the life cycle of a disease at its most easily accessible point and so eliminating the disease. The second is the principle of protecting man by vaccination or immunization, and so preventing the onset of the disease. The first method tends to blot out the malady. The second helps in the blotting-out, but particularly benefits individuals by protection.

## Breaking the Life Cycle of a Disease

A person vaccinated against a disease may enter an area in which the disease is prev-

alent or even epidemic, with little cause for worry. The disease, however, will continue unabated unless all members in the community are vaccinated, and, granting this rather remote possibility, one person from this community may still carry the infection to a new area. The disease thus remains unchecked by this method of attack and will remain unchecked until we direct our efforts toward removing its cause, or better stated, until we remove some element necessary to the development of the organism which causes the disease. The safeguard against anthrax is sterilization of the hides of animals; against malaria, destruction of mosquitoes and treatment of the patients with quinine; against hookworm disease, prevention of pollution of the ground and shoes for persons living in

*An exhibit held in Tsinan, China, by the Tsinan Institute, to further hygiene and health. The villainy of insects seems to be portrayed prominently.*

areas of infestation; and so through the list of preventable diseases. First we learn the life of the disease in man and outside, then we interpose the most effective check possible in one of these cycles.

Yellow fever will serve as an example of both these types of attack. The life cycle of the yellow fever organism consists of a period of development in the mosquito, *Aedes calopus*, next transmission to a human host, then a period of development in this host, and finally infection of another mosquito. Obviously, the only conditions necessary to an epidemic are sufficient mosquitoes, and either the arrival in the country of one patient with yellow fever or the arrival, say on a steamer, of a mosquito already infected.

It is difficult to diagnose yellow fever early enough to prevent the infection of *Aedes calopus* mosquitoes, and, if it were possible to do this, the difficulty of receiving notice of all suspicious cases in time to isolate them from mosquitoes would be insurmountable. It is evident that it is highly impracticable to attempt to control yellow fever by breaking the cycle in the human host.

Work must be done, therefore, in the other field of development of the organism, that outside the human body, and here the attack is relatively easy. A district infected with yellow fever, be it town or rural area, can be cleaned so that yellow fever mosquitoes cannot breed, and this is relatively easy, as the *Aedes calopus* is a house-breeding mosquito. Without mosquitoes to receive the organism from the infected person during the first three days of fever, the incipient epidemic dies, since the bridge between the persons sick and the persons not immune is removed. This method of breaking the life cycle of the yellow fever organism is not merely theoretical, but practical, and is being applied with remarkable success. Cuba, Panama, Guayaquil, and the Central American republics of Guatemala, Salvador, Nicaragua, and Costa Rica have all been freed of the infection by the vigorous application of this method. As long as there are districts in other parts of the world in which yellow fever exists, there is a possibility that these areas may become reinfected, for a new case of the disease may be imported from a nearby locality or infected mosquitoes may arrive in ships. The problem now is to discover all the districts from which the disease originates, and follow there the same blotting-out process. Once all these areas are

*More than ninety of every hundred natives in the coastal regions of Guatemala are infested with intestinal parasites. The prevention of parasitic diseases is a national problem.*

discovered, the intermediate hosts, the mosquitoes, can be removed and the disease will die for lack of carriers to infect new hosts.

With recent progress against yellow fever, the time does not seem far off when the last case will be traced, and the breeding in this area of mosquitoes that carry yellow fever be so reduced that further propagation will be impossible. The world will then see the result long looked for and foretold by General Gorgas, the elimination of yellow fever through the application of the principles of preventive medicine.

### Vaccinating and Immunizing

Another means employed in the prevention of disease is that of rendering the individual immune so that he cannot contract an infection. This has not the far-reaching importance of the first method, as it cannot be applied on so large a scale; but for the individual and for districts it has a wide field of usefulness, which also may be illustrated by yellow fever.

During the year 1920 in Guatemala an epidemic of yellow fever broke out in a small town, and mosquitoes became infected, since antimosquito work was not being carried on at that time. All facts pointed toward a serious epidemic. To prevent the spread of the disease, it was necessary to render the inhabitants immune, because the infected mosquito would be capable of transmitting the disease within two weeks. Yellow fever vaccine was resorted to and all the 1,400 people of the town treated with it, and rendered immune to yellow fever. In this way the spread of the disease to other towns was prevented, a widespread epidemic was averted, and the lives of many inhabitants were saved. It is obvious that the vaccination method cannot be applied to large areas, and this measure in itself could never eradicate yellow fever. To conquer the disease it must be controlled or removed.

A serum for the cure of patients with yellow fever has met with remarkable success when used during the first three days of the fever. This is of inestimable value to the person attacked, but its effect on limiting the spread of the malady is slight.

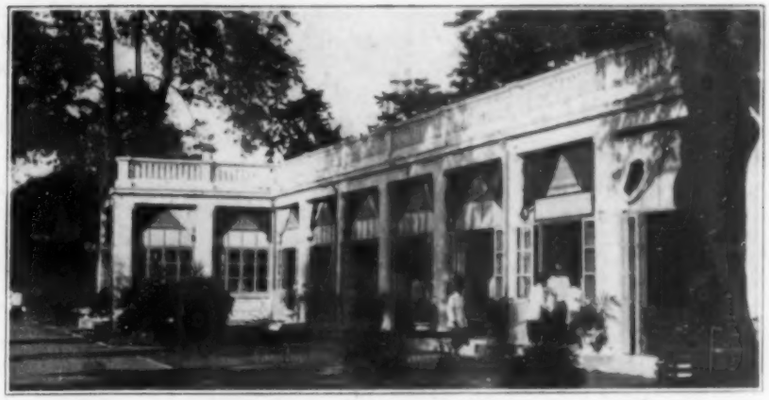
Yellow fever is a disease in which the use of preventive methods is easily demonstrable, but there are many others to which such measures can be applied, although until recently the cure has been the factor which has been emphasized. We have allowed the disease to overtake us, accepted it as an unavoidable evil, and then striven to effect a cure. Now that we know the conditions under which disease organisms live and the mode of their development, we no longer have to rely on cure alone. We can direct attack against an early stage in the life cycle and even prevent the onset of infection.

### Checking Many Infectious Diseases

The discoveries in epidemiology, the life history of disease, and their application in pre-

ventive medicine are in their infancy, and yet how much already has been accomplished from the standpoint of the welfare of nations and of humanity.

Cholera, typhoid fever, bubonic plague, typhus fever, malaria, hookworm disease, diphtheria, anthrax, rabies, and smallpox are already on the list of preventable diseases and have yielded to the application of preventive measures in countries and localities where these are being employed. Each one of these diseases can be held in check and eventually controlled by attack on the producing organism at the most vulnerable point in its life cycle. And many of the diseases can be limited by the second method of rendering the individual immune.



*The Public Health Section of the Siamese Red Cross held an exhibit in Bangkok, in November, 1922. This is the Preventable Disease Building.*

Cholera spreads through infected water or food contaminated by carriers. Water can be rendered sterile in municipal plants or boiled by the individual consumer; carriers are thereby isolated, and the spread of cholera is prevented.

Typhoid fever is spread through infected drinking water, by carriers—persons who carry the germs although they do not succumb to them—who contaminate food and milk, or by flies from exposed sewage. A good means of sewage disposal removes the source of pollution; the carriers can be isolated until they no longer carry the organism, or, at least, warned of the danger of infecting others. In case of epidemics, water and milk can be boiled. The administration of vaccines prevents original infection.

The suppression of bubonic plague entails war against the rat, which harbors the fleas that are the ultimate purveyors of the disease organism.

Malaria, transmitted by mosquitoes, which, as archeologists have demonstrated, wiped out populations of ancient cities in Greece and Egypt, is now giving way before the concen-

*A village in Guatemala where preventive medicine has been introduced.*

*The progress of preventive medicine is slow in any country. When we consider the centuries the civilized races have lived without knowledge of cleanliness, it is not surprising that the native Indian of Guatemala adopts rather slowly the principles that he is taught by the white men who have come to further the spread of preventive medicine.*

trated efforts of prevention. We can look to our southern states to see the methods employed in the blotting-out process. Here results have been so striking as to interest capital and to induce towns, railway companies, and oil companies to invest their money in attempts to control the disease.

It is becoming clear, from the wealth of statistics on hookworm disease the world over, that this malady is curable and relatively easily prevented. The cure itself limits the carrying of disease to new areas, and a simple protection, such as the use of shoes, makes negligible the number of persons infested by the worms.

Thus we could continue through the list of preventable diseases, enumerating the measures that will control them and that at the present actually are controlling them, where they are properly applied.

### Constant Work of Protection Unnoticed by Many

In this work of prevention there are already constant activities that few of us see, but that are continually at work for our protection. Many have experienced the temporary inconvenience of quarantine, which is one of the secondary line-of-defense measures to prevent the spread of disease, an inconvenience to the individual, but of great value to a community or nation. Some of us have noticed the rat guards on the hawsers of ships, the simple but effective means for preventing the rats that carry plague from landing at an uninfected port. Many of the investigations and activities of our health boards go unnoticed: the continual inspection of food, water, and milk; the establishing of sterilization plants for our water supplies; the campaigns in certain areas against mosquitoes that carry malaria; the sterilization of hair used in shaving brushes to kill the germs of anthrax. We do not realize the importance of such activities when we are merely potential victims of a disease, but when some crisis such as an epidemic of typhoid occurs, every one does his best to prevent infection. It is well to emphasize the point that pre-disease measures are the ones that primarily should be stressed and supported by the people. Let these measures stop, and the sad lessons of the disease, suffering and death, will force upon us their real importance.

In the realm of preventive medicine may also be included efforts to cure illness, not so much from a desire to alleviate the actual condition, as to prevent a more serious one. Chronic tonsillitis, in itself not necessarily very disturbing, and often neglected, may lead to incurable disease of the kidneys, heart, or joints. Chronic bronchitis may break down resistance to such an extent that tuberculosis will ensue.

All of us have our philosophies, if not expressed in words, still present in practice—simple philosophies, which take care of many difficulties for us, perhaps failing us in some particulars, but which, as the adhesive tape to the doctor, can serve many purposes. Likewise, there is a medical philosophy that all of us can use, the simple, common-sense philosophy of general hygiene. It is the principle which is now being applied in our "child hygiene" work, the recognition of the fact that it is easier and more valuable to prevent than to cure.

Many diseases, minor and even major in importance, may be sidetracked by the easy application of known facts as to diet, exercise, rest, regularity of habits, recreation, and systematic physical examination at yearly intervals. Most cases of tuberculosis and of colds followed by pneumonia are contracted at periods of overstrain.

The old adages of human experience have their merit, and "a stitch in time" still would save its nine if we cared to take that stitch. Perhaps our medical experiences and discoveries will enable us all to realize that we

can pay to keep well and thus less often pay to regain lost health.

We probably recognize the value of the constant endeavors on our behalf made by the organizations engaged in the prevention of disease, such organizations as our local and state health departments, life extension institutes, tuberculosis associations, and so forth. Do we make use of these to their fullest capacity, and do we enable them to function to the largest limits?

In our day, through the efforts of national health organizations, certain diseases are being so limited that epidemic outbreaks are rare, and diseases are even being attacked in such a way that they are gradually disappearing. At present special groups are designated to take care of the preventive aspect of medicine. Curative and preventive medicine cannot be separated; they bear on one and the same thing, and, interwoven with each other, are both working toward the same end. General practitioners, specialists, state health boards, and national health organizations are all actuated by the same motive—to discover the cause and the cure of diseases and the method of their control. Inevitably all these forces will work even more closely together. With all our evidence of the rapid progress in the understanding of disease and its control, we may feel cheered, in times of wide discouragement along other lines, to know that human endeavor can make its mark, slowly—it is true—but surely, in these definite accomplishments for the welfare of man.

*The ancient Maya city of Quirigua, Guatemala, once covered this site. The inhabitants, it is believed by archeologists, were forced to leave this productive valley because of yellow fever. Now yellow fever is being eradicated from almost all countries.*

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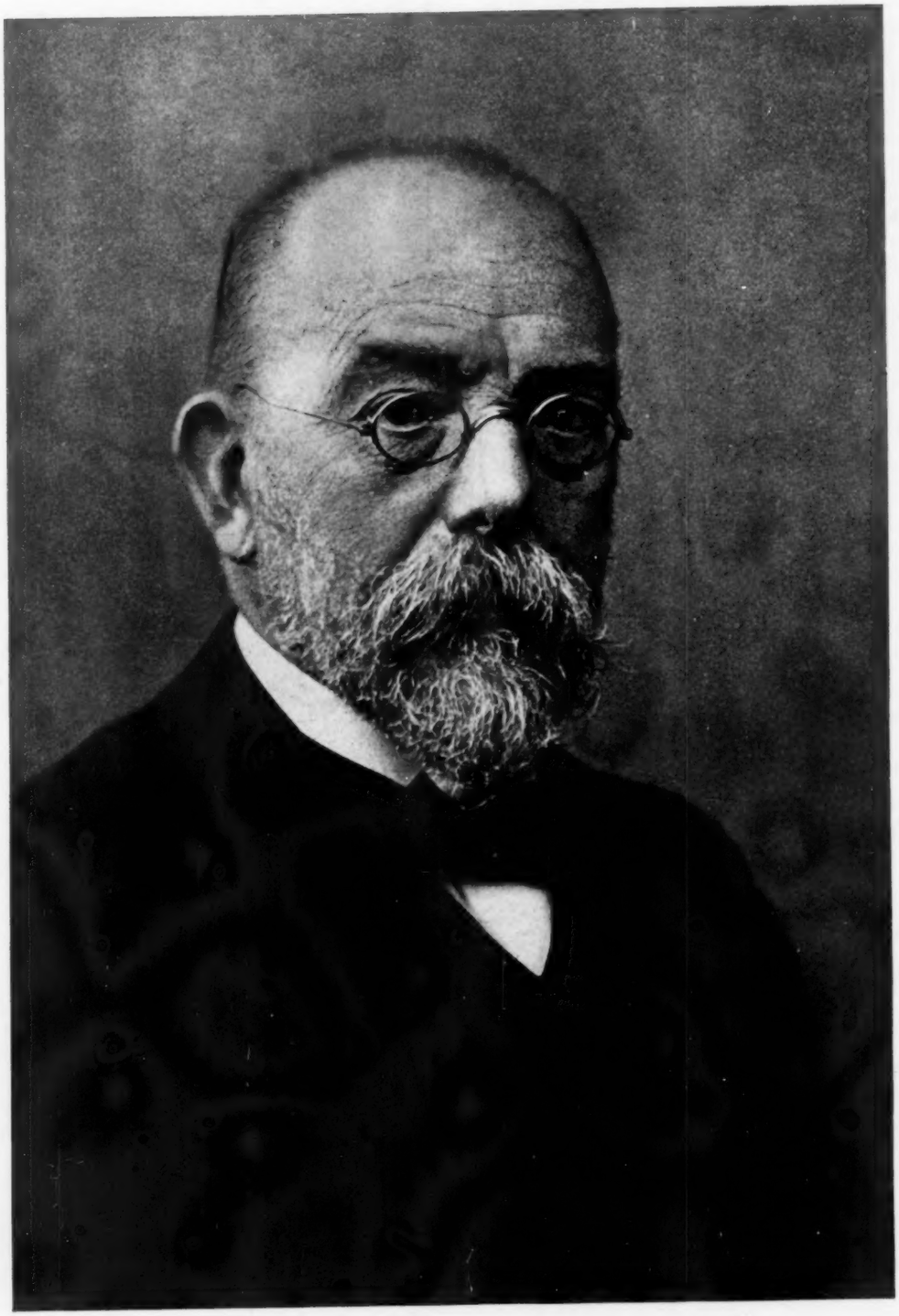
## TEACHING HEALTH IN SCHOOLS

No question can now be raised as to the expediency of teaching health in the public schools. It is by no means a new subject, for not less than half a hundred text-books have been written and introduced into schools. In the east for a considerable time health education has been part of the curriculum. In the absence in the west of a well-developed system for the purpose there has been the extraordinary rise of the modern health crusade. This has the merit of appealing to the child, giving him something to do that is dramatic, competitive and at the same time valuable since it tends to form health habits through means that appeal to the psychology of the child. The millions of crusaders throughout the west and the enrollment of eighteen thousand in Massachusetts in the past four months means a great deal. At the same time the fact that much of this has been done by personal effort of the teacher independent of her regular curriculum, and that there is no adequate school course to take its place, points to a lack in the school curriculum in places. The teaching of health in public schools is, therefore, very irregular. . . . Every effort to establish regular courses of the kind should meet with public encouragement, as steps in the right direction.

—Boston Evening Transcript.



R. Koch.

# Tuberculosis—I. Cause and Prevention

ESMOND R. LONG

A CENTURY ago not less than three hundred of every hundred thousand inhabitants in our cities died each year from consumption. At the opening of the present century the rate for the country at large was about two hundred to the hundred thousand, while for big cities it was somewhat higher. Twenty years later the rate was slightly more than one hundred for both city and country populations. At present it is definitely less than that, with many cities reporting rates in the eighties and nineties, and some with unquestioned reliability in the forties and fifties. Whereas a hundred years ago tuberculosis was the commonest cause of death, today it is second or third. Bunyan's Captain of the Hosts of Death, after sixty centuries of slaughtering conquest, covering all quarters of the globe, in which about one seventh of the human race have been wiped out in their youth, is staggering off the field in America, reduced in rank, with his sword broken.

*For ages tuberculosis has taken its toll. Then, in the latter part of the last century came Villemin and Robert Koch, who discovered its cause, and the first battle was won in the fight to stamp it out. In 1900, Naegeli announced another important discovery: almost every adult has had infection with tuberculosis at some time. We are therefore all concerned in the war against the disease, if only for selfish reasons. As a means of spreading knowledge concerning the cause of tuberculosis, its prevention, treatment, and cure,* HYGEIA *begins with this article a series of papers arranged with the cooperation of the National Tuberculosis Association.*

It is an interesting story, this tale of a pitiless destroyer reaping his way down the centuries, never at rest, desolating in war and peace, mowing to earth the cultured and the savage alike; and even more fascinating is the story of the gathering of the forces for resistance, haphazard at first, deliberate in recent years, that has saved hundreds of thousands from the blade and rescued scores of thousands who have felt its stroke.

## A Plague of Prehistoric Ages

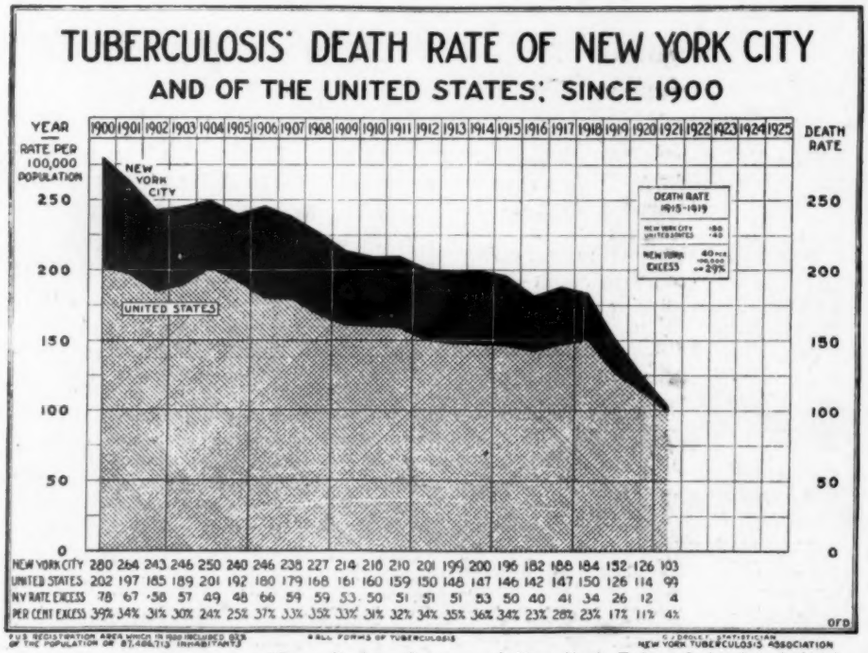
The origin of this devastating plague is lost in the mists of prehistoric ages. Certain it is that at the time Moses was establishing a traveling hierarchy somewhere east of Suez and rumors of the Red Sea disaster were filtering a slow, distorted way up and down the banks of the Nile, there were plenty of persons who coughed chronically, expectorated frequently, discharging often a blood-streaked phlegm, were bright-eyed and feverish, and wasted away finally to die in extreme weakness. And it is certain that there were others with sagging spinal columns and hunched backs, and some with locked hip-joints, who went through life with shortened thighs, all of them suffering from what we now know to be forms of one and the same disease. These facts we have learned from a fascinating, newly developing science, called paleopathology, a study of the results of disease in prehistoric animals.

## Discovery of the Cause

Centuries after the recognition of the disease and its separation from other ailments, and the better part of a century after we knew the changes in the body that occur in tuberculosis, a German physician, with some new tricks in staining and unusual ability in capturing germs and imprisoning them in glass on an artificial, predigested diet, discovered the actual cause of tuberculosis. This was Robert Koch. He was preceded by nearly twenty years by a vigorous French scientist, Villemin, who in 1865 proved by injection of animals that the disease is infectious, transmissible from the sick to the healthy by the introduction of diseased tissue or excretions from diseased areas. Koch's great contribution was the isolation of a specific germ from the kind of material that Villemin had proved to be infectious. Prior to their time most people had the notion that the disease was hereditary, because it so often ran in families. Today we know that the main reason why it so often runs in families is that the sick members infect the well.

Although the discovery of the causative agent of tuberculosis was long in forthcoming, it must be admitted that Koch made an absolutely positive proposition of it when he did find it. He said at that time that in order to prove that a given germ is the cause of a given disease, (1) the germ must be caught red handed in the act of producing the disease, that is, it must be found in the tissue or secretions of the person with the disease; (2) it must be seduced away from all other parasitic associates in crime, and made to

come out in the open and lead a lonesome life for a generation or two in a culture tube; (3) it must be proved that the innocent-looking germ in the tube is a competent individual, able to go back on the job, produce the same disease, and earn its own living on introduction into a susceptible animal; and finally (4) the germ that has been inoculated must be found doing business at the same stand in the animal with experimentally produced disease, that is, in the tissues or secretions of the animal in which the disease has been induced. Koch in a few months' time went through this process with the bacillus of tuberculosis that he had discovered in the sputum and diseased tissues of consumptives, and he set a standard which has become a rigid law for succeeding bacteriologic discoveries for all time.




*(From Drolet. Courtesy of New York Tuberculosis Association.)*

### Characteristics and Peculiarities of Bacillus Tuberculosis

The *Bacillus tuberculosis* that Koch discovered is a rod so minute that about ten thousand of them could lie end to end in a straight line an inch long. It is distinguished from other small germs by several well known characteristics. The first of these is its capacity for producing tuberculosis. Of great importance for quick differentiation from most other bacteria is the fact that it retains color with which it is stained. It is acid-fast; the term refers not at all to its speed, but to the fact that it resists decolorization by acids after it is stained. It should be added that it is moderately difficult to stain in the first place, the surest and most rapid results following under the application of heat. It has one chemical property that is highly characteristic; about one third of its body substance consists of a waxy material, very resistant to any sort of digestion. This wax is believed to play a rôle in "acid-fastness" and, beyond doubt, it confers a peculiar armoring on the bacillus in the battle with its involuntary human host. In addition to these characteristics it has certain preferences in the way it lives. It needs for good growth a temperature about that of the human body, plenty of air, and, although rather adaptable and easy to please as regards certain constituents of its diet, it has a peculiar sweet tooth, and will have that sugary tasting substance, glycerol, or not act on its best behavior.

Now it is one thing to know a good deal about the good and bad habits of a germ and its moral stamina in a test tube or a guinea-pig, and quite a different thing to understand its sociology and migratory tendencies. In spite of our ability to isolate the tubercle bacillus readily from the diseased sufferers and make it perform according to rule in the laboratory, we are seldom sure of the precise manner in which the patient acquired the infection in the first place. This much we do know, and this much all of us ought to have constantly in mind if we are ever to wipe out tuberculosis from among the chief causes of death: In one way or another it is passed on from one living being to another. There are no tubercle bacilli living and reproducing their kind in the fields or in the air or in dark corners or malodorous pools. Outside of their controlled existence in the laboratory, they apparently multiply only in some sort of animal host. In a purely vegetable world tuberculosis bacilli would pass out of existence.

### Travels of the Bacillus

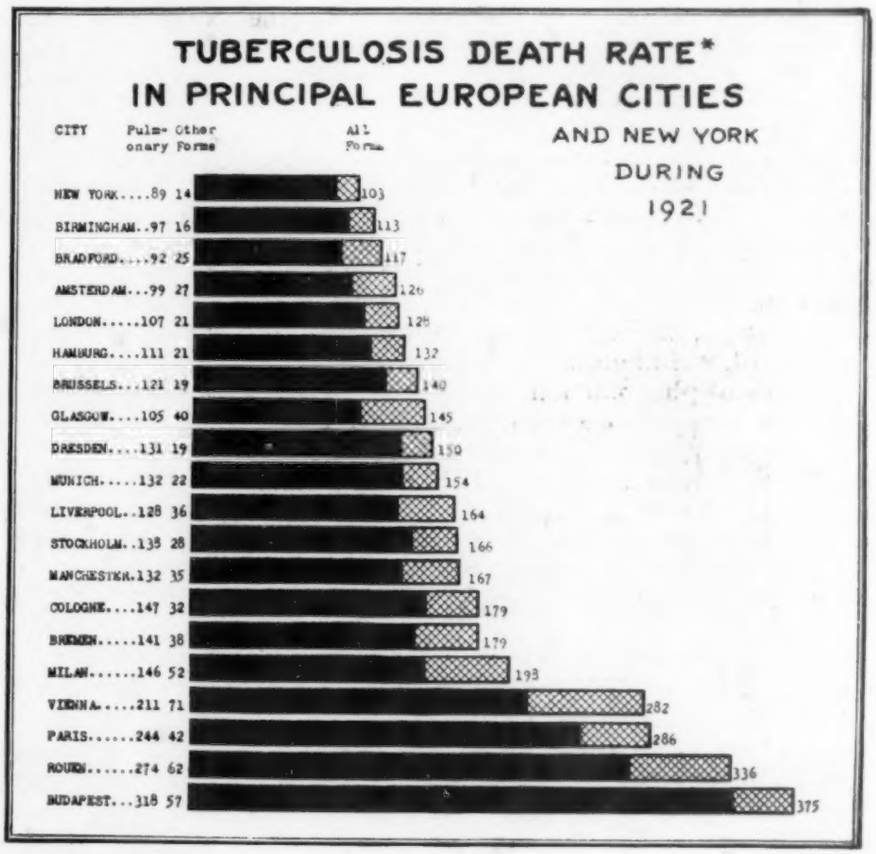
The chief hosts for this bacillus are man and cattle. How does the bacillus pass from man to man and from cow to cow, and does it pass from cow to man? Out of a great mass of testimony the following statements are warranted:

1. The secretions of the diseased lungs of consumptives harbor bacilli and these are the chief source of danger. The material may be coughed out in fine droplets, which bystanders may inhale, or be deposited in bulk on the ground where it may dry and be ground up

in fine dust later to be inhaled, or to contaminate objects which children or other persons take into their mouths. This material is quite resistant to the usual destructive agencies of nature, such as drying, and may remain infectious a long time.

2. The disease never occurs without the bacillus. Bacilli from a consumptive may be taken into the body of an uninfected individual by any or all of the methods just named, and they are the *sine qua non* of the disease. Bad air and lack of sunshine alone never cause it. No mother ever passed the disease on to her child without passing on the bacillus. No well person ever caught the disease from a sick man by "catching his breath," unless he caught the bacillus along with it.

3. Tuberculous cattle are a source of infection for man, because tubercle bacilli are sometimes present in milk. These bacilli are of a slightly different type from the ones causing tuberculosis of the lungs in man, and are seldom or never the cause of lung disease in man. But they do set up infections of bones, joints, and glands. Apparently about one quarter of the cases of tuberculosis of this type in man represents infection from cattle. The bacilli get into the milk, usually not directly through the milk-secreting glands, but as a sequel to contamination of the udder by dung containing bacilli which the consumptive cow has coughed up into her mouth and swallowed.




* To each 100,000 inhabitants.

*These figures were furnished by the Bureau of Records, New York Department of Health.* (*From Drolet. Courtesy of New York Tuberculosis Association.*)

### Almost Universal Infection in Adults

And now I come to a remarkable fact concerning infection. It represents no single discovery, but rather a development of knowledge which makes the first quarter of this century as important for our progress in knowledge of tuberculosis as was the last quarter of last century, in which the bacillus was discovered and its biology worked out. This remarkable fact is the near-universality of infection. Up to 1900, advanced thinkers who knew all that was known about the tubercle bacillus believed that certain persons were infected with the bacillus and developed tuberculosis, while the majority escaped the infection and therefore never developed the disease. But in 1900 the pathologist Naegeli made the startling announcement that out of five hundred bodies which he had examined of men, women, and children dying of all kinds of diseases, more than 70 per cent. had shown some signs of tuberculosis. He brought out the additional fact that whereas only 25 per cent. of the children had signs of infection, practically 100 per cent. of the adults showed some sort of tuberculous lesion. These observations have since been abundantly confirmed. The conclusion to be drawn is unescapable: In cities, where such statistics as Naegeli's were collected, the opportunity for infection is widespread, and with advancing years few or none escape. It is the unsavory but indubitable fact that in the early years of life, not to mention thereafter, most of us not once but several times inhale or swallow the sputum of consumptives, as well, presumably, as that of nonconsumptives, and occasionally take into our stomachs cow dung suspended in milk.

### Infection and Recovery in Most Cases

But there is a corollary to the statement that most people become infected with the *Bacillus tuberculosis*. Before 1900 it was rather generally believed that if a person became tuberculous it was about time to

be making arrangements for the transfer of his property, and to consider with some care his fitness for entering on a future life. And then Naegeli demonstrated that from 70 to 100 per cent. of the population contracted at least very slight cases of tuberculosis, when it was common knowledge that only about 10 per cent. died of it. Obviously—and this is the corollary—60 to 90 per cent. of all adults had had an infection and survived it, and not only survived it but also became completely well. Furthermore, a great majority of these never knew they had had it. A world of hope entered the treatment of tuberculosis with that discovery! Why, after all, this was something to joke about now and then.

Since Naegeli's time a new method of studying tuberculosis has been developed. We no longer have to wait until a person is dead to know whether or not he has been infected with tuberculosis. All the physician has to do is inject into his skin a minute amount of a substance, tuberculin, and wait twenty-four hours or so. If the patient has had the infection, even if it has healed almost to completeness, he will "react" to the injection with a little inflammation at its site. This remarkable phenomenon is the result of a peculiar sensitiveness conferred by infection on all the tissues of the host to the products of the tubercle bacillus. Tuberculin, many forms of which are used, is essentially an extract of the bacillus. The results obtained by this method perfectly bear out statistics based on findings in bodies after death.

### The Brown Man's Scourge

Having come this far we are confronted with this vital question: Why is it that if most of us are infected with the bacillus of tuberculosis, only a few of us get sick from the infection, or in other words, develop the disease tuberculosis? To answer this completely is far beyond the scope of this article. In it would have to be included a discussion of all the multifold factors that influence resistance. For it is by no means all luck that one man escapes while another succumbs, although it must be admitted that chance deals many a cruel hand.

First of all there is a great variation in what we may call native resistance to tuberculosis. Those races of mankind that have longest had the disease in their midst have a more chronic, less damaging type of disease than those to whom it is new. When the whalers invaded the South Pacific at the beginning of last century, careless and selfish, contending there was "no law of God or man west of Cape Horn," they did more than introduce syphilis and encourage prostitution among the natives. They brought tuberculosis and numerous other diseases for the first time into the islands. Consumption became a frightful scourge. The tuberculosis of New Bedford and that of the Gilbert Islands had only a basic resemblance. Where the one ground down its few through progressive invalidism, the other wiped out whole villages in a few months' time, children and adults alike.

Just why the white man, who has known tuberculosis a score or more of centuries, and the brown man, who has known it only one, show such a great divergence in their reaction to tuberculosis, is not a problem with a single answer. It must not be forgotten that white men live in fairly decent houses as a rule and usually eat with a fork, while the Polynesian is a simple, gregarious soul who assembles his entire household under one small, leaky thatched roof, and seats them for meals on the dirty, sputum-drenched soil in front of their "home," around a poi bowl, the content of which is usually graded according as it is of the one, two, or three finger variety. There is one bowl and there are no spoons. The *modus operandi* is a dexterous twist of the first two digits into the pasty mass, and a relishing suck at the adherent slime, followed by return of the finger to the common poi bowl, and repetition *ad nauseam*. The wandering beach-comber is always hospitably invited to the party. Under such conditions it is not hard to imagine the transmission of massive infection.

However, in addition to the hygienic factor, a varying resistance under common environmental conditions has been demonstrated repeatedly. Most of the Eskimos presented to our interested gaze at the Chicago World's Fair were sacrificed to tuberculosis, bearing a pathetic resemblance in their lack of native resistance to the neighboring exhibit of chimpanzees. The negro and the American Indian in our midst have only recently begun to show the white man's resistance. How races become tuberculized and increasingly resistant is a problem for the expert in genetics. It may be by the operation of the principle of the survival of the fittest, or it may be the result of age-long immunization of the germ plasm and transmission of an acquired characteristic.

The last three paragraphs represent more or less of a digression. Our primary interest is this problem: Of one hundred infected boys and girls, eighty or ninety absorb the tubercle formed, without their own knowledge, although something happens within the body and they carry small scars with them henceforth; eight or nine sicken of the same disease in later life and recover, while another eight or nine sicken and die. As to the first group, it is a fact that first infections frequently do not cause illness, and there is much evidence for believing that when symp-

toms of illness, fever, and malaise do occur, they are the result of our own resistance; that is, they are due to poisonous products formed in the reaction between our own cells and the invading bacteria. And yet that first infection, which perhaps healed before causing noticeable illness, makes of the host a changed man. Henceforth he reacts differently to the same infection and is strongly resistant to a massive invasion of germs which, had it occurred as a first infection, would have caused extensive, perhaps fatal, disease. Most of us are in this condition, as a result of some slight infection at an unknown early period.

### The Causes and Development of Susceptibility

There is much reason for believing that, as a general rule, unless adults are exposed to an unusually massive infection, they are not susceptible to infection from outside. Yet it is a perfectly evident fact that not a few of them do become consumptive. And why? It is because of a flare-up of their old first infection. And when one asks why should the old infection flare up, he touches the root of the whole tuberculosis problem. In general, it may be said that a first infection, although well controlled in the actively growing period, may progress into active disease in young adulthood if the first infection was very large, or—and this is important—was acquired at a time in childhood when bodily vigor was low, and therefore made a considerable inroad at first. Also, as is well known, a flare-up may be the sequel of an acute disease, such as measles, pneumonia, or typhoid fever. And, finally, some strain of a less definite sort may be the predisposing factor. This may be any one of those conditions that constitute bad hygiene, long hours of work, insufficient sleep, alcoholism, poor food, or not enough food, and inadequate ventilation and lack of sunshine. Doubtless the unhappiness associated with them also plays a not inconsiderable rôle.

It will be agreed that no item in this list is unpreventable. One may go further and say that it is to the prevention of these things, to general improvement in living conditions in the last hundred years, that most of the reduction in deaths from tuberculosis in America and England is due. Let me cite a few examples in which only the names are fiction—the tiny Oliver Twist, starved in the dirty work-house, Nicholas Nickleby's friend Smike suffering in Mr. Squeers' school, and David Copperfield and the unhealthy Mealy Potatoes working together for long hours washing bottles in a dark warehouse. These were common conditions, as that staunch reformer, Charles Dickens, well knew. Compare the effect of a first infection on these hungry, abused children, with that upon a happy well fed boy accustomed to spend a couple of hours every afternoon at baseball in a city park. Which infection would heal or become latent the sooner? Compare the opportunities for massive infection instead of slight infection, developing immunity, in these dark, confined, unhealthful surroundings. When the fair-play-for-everybody element is given its true value in the conquest of tuberculosis, the names of men like Dickens, who have fought for children and campaigned against poverty, will stand on a par with those of Villemin, Koch, Ehrlich, Pirquet and Trudeau.

### Let Us Learn from the Veteran "Lunger"

Not that I am undervaluing the rôle of medical science, directly or indirectly applied. In addition to saving thousands of lives by early diagnosis and isolation, medical men have obstructed the march of tuberculosis every time they have in any way aided the cause of public health. The great reduction in the incidence of typhoid fever and in the diseases of children has had a proportionate, favorable effect upon the number of deaths from tuberculosis. By no means least is the education, spread first, and largely, from centers for the treatment of tuberculosis. As Vaughan says, "In our own country all intelligent people now know the fundamental facts concerning the nature and transmission of tuberculosis." But they do not always apply their knowledge. And let me say in conclusion that many a good citizen could well take lessons from the veteran "lunger," with sanatorium training, who covers his mouth when he coughs and respects the sidewalk. There is a good reason for the fact that the incidence of tuberculosis acquired on the spot is less in Saranac Lake, where hundreds of consumptives reside, than in other towns and cities throughout the country. The sidewalks are cleaner. When the "Do not spit" sign is as much respected on Broadway, State Street, and Market Street as it is in Saranac Lake, Asheville, and Colorado Springs, and when other like precautions well within our understanding are taken, we may look forward to a tuberculosis death rate not of one hundred or ninety in a hundred thousand, but of fifty, and going down.

# The Deadly Amanitas

THEODORE TIEKEN

MUSHROOMS and toadstools are most important among poisonous plants because of their growing popularity as a food. The number of poisonous species is quite large, from sixty to seventy in all, but there are probably only half a dozen or less that are really dangerous to life. In this brief article I shall confine myself to the discussion of the deadly amanitas.

### Fly Amanita

The fly amanita (*Amanita muscaria*) is known locally as the fly fungus, fly agaric, fly killer, fly amanita, and false orange amanita. It is one of the most dangerous fungi, because it contains muscarine, a very poisonous alkaloid that is not destroyed by cooking, and it is the best known of the poisonous varieties because of its wide distribution and attractive appearance. It causes symptoms of poisoning very soon after being eaten and may cause death in less than twenty-four hours.

*Among the most handsome plants are the most deceptive and poisonous ones. The deadly amanitas are probably responsible for the largest number of cases of poisoning from mushrooms. Mushrooms gathered by the novice are rarely considered safe and therefore rarely eaten. It is the person with some knowledge and experience in gathering them who often is in greatest danger because of a false sense of security, since the appearance of the amanitas varies with localities and is much like that of some edible mushrooms. This article is a very brief summary of facts regarding this dangerous species.*

The handsome fly amanita grows from four to twelve inches tall in many localities in the United States, chiefly in the pine and oak forests where there is plenty of moisture. It is very pleasing in appearance and taste. During its early stages of development the cap is oval and convex, but as it grows in height the cap expands and becomes flat, and finally concave. The upper surface is invariably rough and warty. Its color varies from a yellowish white to orange; not infrequently it becomes bright red. The base is rough and marked with short stubby projections that gradually change to soft wavy shavings in the upper part of the stem. In general outline this fungus greatly resembles the orange amanita (*Amanita caesarea*), but it differs from it in the absence of a cup and in the presence of white gills and stems, instead of yellow. It always has a warty rough cap instead of a smooth one. Both species grow in the pine and oak forests from early spring until autumn, but the true orange amanita does not appear so late in the fall as the false or poisonous variety. The fly amanita is easily distinguished from the common mushroom (*Agaricus campestris*) by its white instead of purple gills and spores, by its warty cap and bulb-like stem, and especially by its place of growth; the common or meadow mushroom never appears in forests.

### Symptoms

The symptoms of muscarine poisoning come on very soon after the mushrooms have been eaten. In from fifteen to thirty minutes saliva begins to flow freely, there is a profuse flow of tears and perspiration, and nausea and vomiting set in with sharp cramp-like pains in the abdomen and a profuse watery diarrhea. The pulse is at first slower than normal; later it becomes quickened and irregular. The pupils of the eyes contract. The patient may have great difficulty in breathing, and the muscles become very weak. He may be dizzy and confused, but the symptoms relating to the brain are not so marked as those of the other organs. In severe cases delirium, hallucinations, and stupor have been noted, but these symptoms have been attributed to a poison other than muscarine.

### Treatment

When poisoning from mushrooms is suspected, a physician should be called at once, if one is available. The stomach should be emptied by causing the patient to vomit. The bowels should be flushed with a salt solution, and heat applied to the body. Only a physician can administer atropine, which is given when the poisoning is from *Amanita muscaria*, because it has the directly opposite effect on the body that muscarine produces.

Because cooking does not destroy the muscarine, poisoning from *Amanita muscaria* is rather frequent.

### Death Cup

Another very poisonous amanita is the death cup (*Amanita phalloides*). It is also called the poison amanita, destroying angel, and

bulbous amanita. This is not so large or attractive as the fly amanita, but it nevertheless attracts the attention of the inexperienced epicure. When fresh, it does not have a disagreeable odor or taste, nor a disagreeable appearance due to the presence of larvae. It grows from three to six inches tall, and has a smooth velvety cap that is convex when the fungus is young; later it becomes concave. Although the death cup is usually white, it may be yellow, green, or brown. Sometimes, if the plant grows in shady places, the cap is spotted and the stem is white. A more or less conspicuous cup almost invariably forms at the bottom of the stem, where it enlarges. It is especially abundant near Washington, D. C., in the late autumn. Although it is usually found in pine forests, occasionally it encroaches on the meadows and lawns, which makes it all the more dangerous as it is then more easily mistaken for the meadow mushroom. It claims from fifteen to twenty victims annually in the United States.

Kobert, in 1891, isolated a poisonous substance from *Amanita phalloides* and called it phallin. For some time it was thought to be the poisonous constituent, but Ford, in 1906, found a toxin far more poisonous than phallin, which he named amanita toxin. He demonstrated that phallin, which causes solution of

*The deadly fly amanita, Amanita muscaria, varies from a yellowish white to orange; sometimes it is bright red. The upper surface is invariably rough and warty.*

In very dry weather the cup is less conspicuous, but it is invariably present.

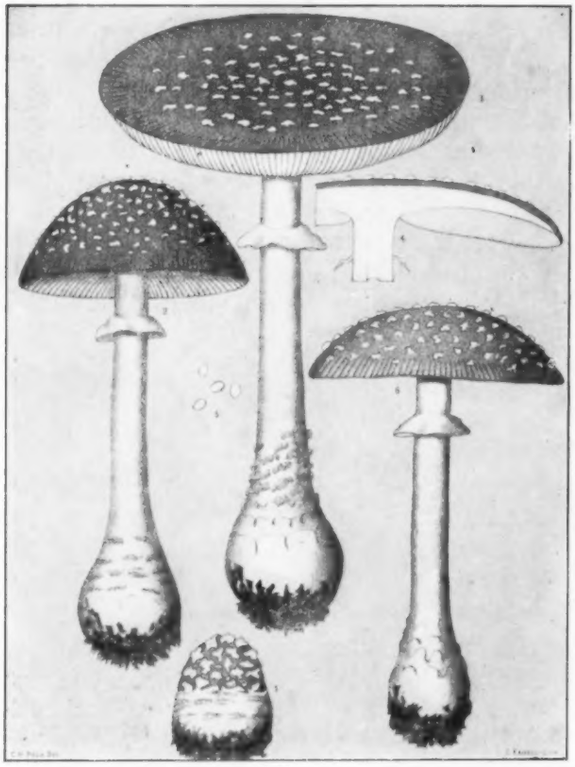
In general appearance the death cup is somewhat like the common mushroom (*Agaricus campestris*), but the latter does not grow in the forests, neither does it have white gills and spores nor a volva at the base of the stem. The greatest danger is in mistaking the death cup for the smooth lepiota, which is much sought after by the connoisseur. The lepiota has a hollow stem and no volva, and is usually brownish; it should be easily differentiated. The death cup is the most poisonous of all the fungi. It grows throughout the eastern, middlewestern, and western states.

the red blood corpuscles, is chemically destroyed by boiling, but the resulting products are poisonous. Amanita toxin does not have the power to dissolve blood corpuscles, but it produces hemorrhages and degeneration of the tissues of the organs, especially of the liver and kidneys. The experiments of Marshall and Rountree prove that most of the nervous and mental changes are due to damage to the kidneys and consequent poisoning from the absorption of toxins in the body.

### Symptoms

The symptoms of poisoning by *Amanita phalloides* do not develop for several hours

after the mushrooms are eaten. Usually the onset is ushered in by sudden abdominal pains, intense thirst, nausea and vomiting, and



*The cap of the fly amanita, Amanita muscaria, is oval and convex when young; later it expands and becomes flat, and finally concave. This drawing shows the fungus in its various stages of development.*

*(From Halsted. Courtesy of New Jersey Agricultural Experiment Stations.)*

very profuse watery discharges from the bowel, which may contain blood and mucus. Marked muscular weakness, rapid, weak heart, jaundice, bleeding gums, and blood in the urine soon follow. Mental disturbances usually occur late and the patient may have delirium and convulsions. After three or four days he sinks into collapse, followed by death.

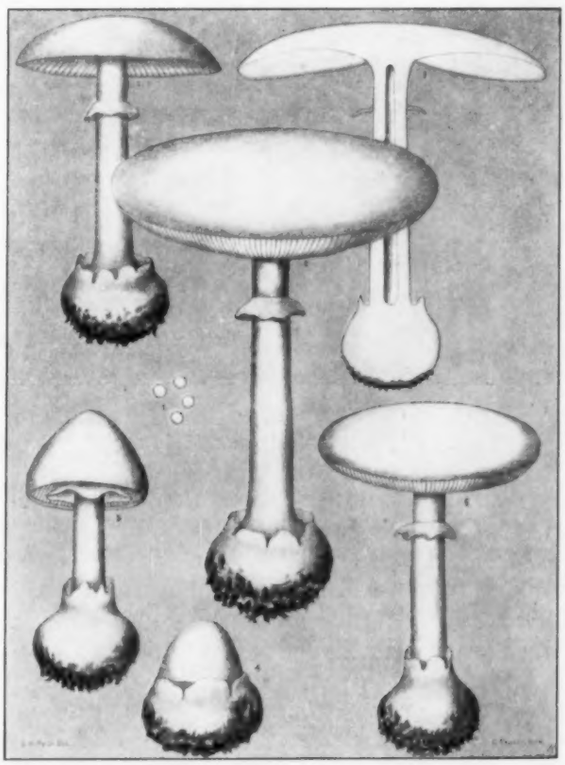
### Treatment

If the patient is seen early the stomach and bowels should be thoroughly emptied and stimulants administered. A heart stimulant in a suitable form for hypodermic injection should be given by a physician. On account of the destruction of blood corpuscles produced by phallin, remedies which prevent this should be used by the physician. If the patient can be sent to a hospital, blood transfusion should be resorted to as early as possible. In spite of all that is done for these patients, most of them die. The amount of the mushrooms eaten, the length of time it is retained in the stomach, and the susceptibility of the person influence his chances of recovery.

### Mushroom Poisoning in History

Varieties other than the amanitas that have been troublesome to the inexperienced collector are the parasol mushrooms. The false parasol mushroom (*Lepiota morgani*) is poisonous, while the true parasol mushroom (*Lepiota procera*) is a prime favorite with the epicure. The Jack-o'-Lantern or false chantrelle (*Clitocybe illudens*) is very poisonous, while the true chantrelle (*Cantharellus cibarius*) is a delectable food. The *Volvaria speciosa* and *Volvaria gloiocephala,* although handsome and attractive, are best avoided, as there is question regarding their edibility, and they are easily mistaken for the yellow amanita (*Amanita citrina*) which is deadly poisonous. The *Panaeolus* is poisonous and easily confused with the common meadow mushroom.

The history of mushroom poisoning has many interesting features. The first authentic recorded cases occurred in the family of the Greek poet Euripides, who lost his wife, his daughter, and two sons in one day (about 420 B. C.). Among others whose lives have been sacrificed through gross ignorance or carelessness were Pope Clement VII, the Emperor of Jovia, Emperor Charles VI, Berronill of Naples, the widow of Tsar Alexis, the Princess of Conti, Count de Vecchi, and



*The death cup, Amanita phalloides, is usually white, although it may be yellow, green or brown. There is always a cup surrounding its bulb. The growth of the fungus from the time it first appears above the ground is represented here.*

*(From Halsted. Courtesy of New Jersey Agricultural Experiment Stations.)*

many others, including not a few members of the medical profession.

Most of the cases of poisoning from mushrooms in the United States occur in foreigners, because they have been accustomed to eating mushrooms in their native lands and are unfamiliar with those indigenous to our own country. If people must eat mushrooms, they should confine themselves to the cultivated varieties or learn to recognize those that are edible and harmless.

### Rules for Gatherers of Mushrooms

Dr. W. G. Farlow, of Harvard University, has formulated rules, which, scrupulously observed, will prevent the eating of the most poisonous varieties of mushrooms.

1. Avoid fungi when in the button or unexpanded stage; also those in which the flesh has begun to decay, even if only slightly.
2. Avoid all fungi which have death cups, stalks with a swollen base surrounded by a sac-like or scaly envelop, especially if the gills are white.
3. Avoid fungi having a milky juice, unless the milk is reddish.
4. Avoid fungi in which the cap is thin in proportion to the gills, and in which the gills are nearly all of equal length, especially if the pileus is bright colored.
5. Avoid all tube-bearing fungi in which the flesh changes color when cut or broken, or where the mouths of the tubes are reddish, and in the case of other tube-bearing fungi experiment with caution.
6. Fungi which have a sort of spider web or flocculent ring around the upper part of the stalk should in general be avoided.
7. Do not collect mushrooms in or near wooded areas except for study purposes.

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# *What Do We Measure by the Intelligence Test?*

L. L. THURSTONE

PSYCHOLOGISTS have come to distinguish between what is known as general intelligence and special abilities, such as in music, baseball, poetry, freehand drawing, mechanical tools, and many other fields. They have developed a great number of mental tests that are specially devised to measure special abilities. The best developed among these is the series of tests to measure musical talent, perfected by Professor C. E. Seashore and his pupils. With these special tests, we are not here concerned, however, although they are of great importance in securing an estimate of a man and his capabilities.

*Last month Mr. Thurstone explained the nature of an intelligence test and why such a test can be useful to the prospective employer. "It measures, roughly only, the ability to deal with abstract ideas, which ability is the very essence of intelligence and intellectual work." In this concluding portion of his paper, Mr. Thurstone comments on a criterion for the intelligence of children and the relation of intelligence to other mental traits.*

In intelligence tests it has been found useful to include a random collection of questions about current events and other facts to which any one has access through newspapers and magazines. The theory is that, other things being equal, the bright person will pick up, without intentional study on his part, many facts of general interest. Such questions in an intelligence test are intended to measure the result of intelligence. Information questions are only an indirect measure of intelligence, because intelligence is not actually at work when the information question is answered unless there is some figuring or reasoning or problem-solving involved. If, on the other hand, the information questions are far fetched, they fail to measure adequately the fruits of intelligence. Mr. Edison's attempt to make an intelligence test out of his encyclopedia is an example in point.

### Criticism of Intelligence Tests

There is one really serious criticism of the intelligence tests that must be considered, because it touches the vulnerable part of the whole program of intelligence tests. The criticism has been made that there is no definition of intelligence that psychologists have agreed on, and that they are therefore testing for something that they are unable to define. If we are conducting tests for general intelligence it is of course necessary to specify a criterion by which the tests are to be judged, and in specifying that criterion we are either implying or explicitly stating a definition of intelligence. It is easy enough to understand that if a psychologic test is devised for measuring musical talent, the criterion would be fairly definite. Has this person musical talent as judged by musicians? Does he progress rapidly in studying music? Is he acknowledged to be a good listener, a good performer, or a good composer? If so, he is rated high and the test should rate him correspondingly high. Similarly the persons who have low musical appreciation or ability to perform

should be rated low on the tests for musical talent. It is easy to establish a criterion to be accepted generally when we are dealing with tests for the special abilities. But the situation is otherwise with tests of general intelligence.

### Bright and Dull Children

If we are comparing children as to their relative brightness and dulness, the only definite criterion, it will be quite generally admitted, is in their progress in school, although that is in no sense a perfect criterion of intelligence. We rarely say that a child is stupid if it is making exceptionally good progress in school. We are fairly safe in saying that a child who is rated as a good student by its teachers should be rated high on the intelligence test. If that condition does not obtain we should immediately discredit the test. The difficulty is at the other end of the line. We do say sometimes that a child is very bright in spite of the fact that it is making a poor showing in school. Many children indicate superior mental alertness in a great variety of situations although they may be dunces in school. What do the intelligence tests say about such children? They vary. Sometimes such a child would be rated high on the intelligence test, and the practical conclusion is then made that the child is bright, but that his interest has not yet been aroused in school work. The discrepancy between general observation about that child's mentality and his school progress is in such cases attributed not to any lack in intelligence, but to a lack of that which drives intelligence, the motive power which for human beings is interest. Not infrequently such a child matures rapidly and comes out as well as the other children who progressed more evenly because of the more nearly normal development of emotional life.

The opposite situation is one in which a child who is considered bright, as judged by parents and friends, is making slow progress in school and a low mark in the intelligence test. Here we are dealing with a fundamental difference in the standards by which brightness is judged. Such a situation brings out the criticism that psychologists do not know what intelligence is. The intelligence tests for children were originally devised for the classification of children in school, and naturally the tests favor the kind of brightness that makes for a good showing in school work. The fundamental characteristic of the intelligence under investigation is the ability to deal with abstractions, with ideas that do not necessarily have a tangible, physical, immediate, concrete equivalent. Superior intelligence, therefore, means only the ability to deal with ideas that are not necessarily completely defined by a thing that one can grasp with the hands, ideas that cannot be represented completely by some tangible thing. Examples would be such ideas as justice, acceleration, credit, and most principles, rules, and laws.

A child may be clever with mechanical and material things, he may be witty, and persuasive, a leader in children's games, ingenious in getting what he wants, and in devising substitutes for the things that he cannot get. These and many other characteristics are sometimes judged to be signs of brightness by those who have opportunity to observe the child outside school. This has brought about a suggested distinction between several forms of intelligence, such as intelligence with ideas, intelligence in social situations, and intelligence with mechanical things. Many of these classifications are in the nature of rationalizations. If we do not excel in ability to deal with abstract ideas, we naturally enough try to set up some other standard in kinds of cleverness that we do possess and that we are eager to have acknowledged as the full equivalent of the intelligence that we do not have. In many cases these other variants of mentality, such as cleverness in handling people or cleverness in handling tools, serve the purpose of attaining a respectable living or a desired social status. The ability to handle people successfully and to make friends readily and to become a leader of men is no doubt a coveted ability that commands a financial and a social prize, but it is not necessary to equate it on the intelligence scale with superior intelligence, which is the ability to do intellectual work.

### "Success" and Intelligence

The practical solution is to regard the intelligence test in the light of what it actually is, namely, a rough measure of the person's ability to do intellectual work. This interpretation is legitimate for children and for adults. The fact that a man has a relatively low mark in intelligence tests indicates that he probably will not succeed well in intellectual work, whether that be in the academic school courses or in the professions. But the low or mediocre intelligence test mark does not indicate that the person, so labeled, is doomed to everlasting failure in life. He may succeed very well in business. He may be able to sell us life insurance so well that we cannot resist. He may become an artist, although leading creative artists must have superior intelligence. A low mark on the intelligence test indicates, then, a mind that does not excel in intellectual powers, but it tells us nothing about social, emotional, volitional, and personal traits.

A man may show high attainments in his intellectual powers and still be a flat failure in life. He may have only a mediocre rating for intellectual power and still attain a promi-

nent position in public life. Other things being equal, that boy will succeed best who has superior intellectual endowment; and other things being equal, that boy will succeed best who has superior endowment in the non-intellectual mental traits also, such as perseverance, agreeable personality, and capacity for leadership.

### Relativity of "Very Inferior Intelligence"

Some misunderstanding seems to be current regarding the exact meaning of the designation "very inferior intelligence" applied to the marks of the army intelligence test. These labels or names, as well as the letter grades, A to E, are entirely relative. Nothing can be inferred regarding the future of the race from the fact that a certain percentage of the men in the draft army obtained a rating of very inferior intelligence, because the inferiority is only relative to the average of the army. If we should all wake up tomorrow morning twice as intelligent as we now are, and if we were to take another intelligence test, we would revise our definitions of superior and inferior intelligence in terms of scores. Those who score lowest in the scale would still be called inferior, relative to the rest of the group with which they would be compared, no matter what the absolute intelligence might be. The term inferior intelligence refers to relative standing. It refers only incidentally to absolute standing. If we were living in a community of geniuses, we should become so accustomed to superior mentality that our ordinary adult intelligence would be labeled very inferior. It was an entirely arbitrary matter to decide what percentage of the men in the army were to be called inferior, average, and superior. As a matter of fact, the psychologists in the army changed several times the percentage of men who were to be called very inferior, and they fixed the scale limits for this percentage accordingly. If we decide, arbitrarily, to call the lowest 5 per cent. of the population very inferior, it does not matter what the absolute intelligence is. The lower end of the scale will be so labeled.

In a recent newspaper editorial the same confusion between the absolute and the relative meaning of these terms appeared in its grossest form. The writer called attention to the terrible fact that one half of a certain regiment were below the average in intelligence. Why should we expect it to be otherwise? If we measure the stature of one thousand men and determine their average height, we should of course expect to find that about half of the men would be rated as short, and the other as tall, the dividing line being the average as determined by the statures of the group itself. It is the same with the intelligence test marks. We gave an intelligence test in the draft army and determined the average mark. One half of the men were then rated below that average and the other half were above it. A classification into only two large groups was too rough, even for practical purposes, and the total range of marks was therefore divided into seven parts. The lowest part of the range was called D—, very inferior intelligence; it was a matter for some discussion to decide what percentage of the total to put in this class.

### Practical Use of Intelligence Tests

The intelligence test does not purport to measure the sum total of mentality. It measures, roughly only, the ability to deal with abstract ideas, which ability is the very essence of intelligence and intellectual work. The test mark is probably largely determined by native endowment, but it is surely modified by past experience and training. It is certain that the intelligence test mark is less affected by past schooling than any of the customary educational examinations. This latter characteristic is the reason for the whole intelligence test movement. The mental test serves exactly the same function as the test with original problems in geometry, which measures a student's resourcefulness and ingenuity in attacking that which is novel for him in geometry. But there is this fundamental difference: the intelligence test does not assume any special factual knowledge in any special field. The intelligence test is intended to measure intellectual resourcefulness and ingenuity on subject-matter that is generally known, so that the test mark is as far as possible unaffected by formal training of the informational sort. The practical intelligence tests do not attain this ideal perfectly because some of them presuppose, for example, the knowledge of reading and writing, and these attainments are not absolutely universal, but in the groups in which the intelligence tests are actually used they are relatively free from the effects of informational training. The special mental tests devised for illiterates assume a still lower informational basis for the exercise of intelligence.

Finally, let it not be assumed that a high mark in the intelligence test will ever be accepted as a substitute for formal schooling. The fact that a man has intelligence equivalent to that of the average high school or college graduate does not in itself make him equal to the formally educated man in value to society. The value of the tests consists in the effectiveness with which talent may be discovered and given the advantages of education. The immediate advantages to society are in the fairness made possible in the selection of employees and in the diagnosis of causes of maladjustment of children and adults.

# Plain Facts About Health and Disease

## HEALTH NEWS OF THE MONTH

**Iodine as a Preventive of Goiter**

Typical of the careful progress of scientific medicine is the gradual development of the giving of iodine for the prevention of goiter. In 1917, Dr. Marine and Dr. Kimball, after extensive experiments, concluded that it was possible to give small doses of iodine to practically every child without risk to the health, and that this method would prevent the development of goiters in persons living in regions such as those surrounding the Great Lakes, where goiter is especially prevalent. Since that time the method has been widely extended, and recently the originators have published a summary of their work. In Switzerland, on account of the extraordinary results obtained since the method was established in 1918, the goiter commission has recommended that the treatment with iodine be instituted as a public health measure throughout the republic. In this country the school authorities of Akron, Kent, and Ravenna, Ohio, have been using the method as a routine. It has been employed in Berea and Warren, Ohio, and extensively in the large factories in Cleveland. This year, the school girls of East Cleveland, Shaker Heights, Warren, Niles, and Findlay, Ohio, Grand Rapids, Michigan, and Hammond, Indiana, are being given tablets, each containing a small dose of iodide, and each girl takes one tablet a week throughout the year. It is recommended that in so-called goiter districts every woman keep the thyroid gland saturated with iodine during pregnancy, and that every girl take iodine during the years from eleven to sixteen.

M. F.

**Operations on the Heart**

If there is one organ of the body that is viewed with awe by the physician and the layman alike, it is the heart. It is only within recent years that surgeons have attempted to approach this organ, even for attempts at repair following stab wounds or gunshot injuries. In 1902, Sir Lauder Brunton, a noted English physician, suggested the possibility that the valves of the heart might be operated on in cases in which they were dilated or constricted, and recent years have seen attempts to put the suggestion into effect. Last year Dr. Allen and Dr. Graham of the Washington University Medical School in St. Louis performed operations on animals with a device called the cardioscope. This was a tube that penetrated the large vessel leading from the heart, was pushed down into the heart, and used as a carrier for an instrument with which the valves were cut. Last month, however, Dr. Cutler and Dr. Levine of Boston operated directly on the heart of a patient who was seriously ill with heart disease, and apparently they were successful in cutting the constricted valves and in repairing the heart after the procedure was completed. At the time the operation was reported, the patient had recovered from the operation, although it was too soon to say whether the procedure had been of benefit in controlling the disease of the heart. In any event, this operation marks an epoch in the science of surgery, a science which has already reached a high point of development. It illustrates besides the way in which progress in surgery may properly be made: first a careful study of the disease and the underlying conditions, second, a thorough working out of methods and technic on experimental animals, and finally, the application of a perfected technic to the human case.

**"Devil's Grip"**

About the middle of July, Dr. Maude M. Kelly of the Virginia State Board of Health reported that she had seen a number of persons in Hanover County who had recently suffered from an illness that began with pain in the abdomen, but which did not resemble the usual kind of digestive disturbance. Later, similar cases were reported in other counties of Virginia, and since that time more than four hundred cases have been reported throughout the state. The condition has also appeared sporadically in other parts of the country, and apparently attacked the large majority of the children in an institution in New York. A similar disease appeared in Virginia in 1888, and was described by Dr. W. P. Dabney, under the name given to it by one of the patients, as "devil's grip."

Patients who have this disease complain first of severe abdominal pains which come on suddenly and which extend later to one or both sides of the lower part of the chest cavity. Breathing is difficult and rapid. There is some fever, and most of the patients perspire freely. The pain is increased on movement and in some cases by swallowing. Most persons who have the disease are constipated, but the illness is frequently followed by diarrhea. Many of the victims complain of headache and pain in the back. After from four to ten hours of severe pain and difficult breathing the condition begins to subside, but there may be relapses. However, practically all the afflicted recover without secondary complications. More children than adults are affected. The epidemic appears to be confined largely to rural communities in Virginia, and to be spread by contact from one person to another. Although the cause of the disease is not known, the disease may possibly be one of the unusual manifestations that follow influenza epidemics, as shown by medical history. M. F.

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## POISONING FROM DYED FURS

LAST winter and the winter before many cases of a peculiar skin poisoning of women were reported in England. The principal symptoms were blotches and swelling with itching and burning, so severe in some cases as to prevent sleep for several nights. Investigation has shown that the trouble came from wearing furs, chiefly rabbit dyed to imitate beaver. On analysis the dye was found to be metaphenylenediamine. The dye apparently had not been fixed properly, so that a part was removed when it came in contact with moist skin. Metaphenylenediamine is closely related chemically to paraphenylenediamine, which has been much used in this country as a constituent of hair dyes and as a fur dye. Numerous cases of severe poisoning have resulted in past years in this country from the use of this hair dye and of dyed furs. The phenylenediamine dyes are colorless compounds that become black on oxidation. The completely oxidized compounds are not very irritating to the skin, but an intermediate stage is brown, and in this stage the dye is most often employed in coloring fur. There appears to be great variability in sensitivity among different persons. Most persons who use the hair dyes or who wear dyed furs suffer no inconvenience, but occasionally one develops alarming symptoms. It would be well for persons who wear dyed furs to remember that irritation of the skin may be due to their furs. Furs that have caused poisoning may be recolored with some dye that is properly set and will not rub off.

L. E. W.

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## A HIGH SCHOOL BOARD OF HEALTH

A HIGH school board of health is a novel and effective method of impressing high school pupils with the importance of health and health habits and of instructing them in the methods of health administration. Such a board of health has been organized in the Latimer Junior High School of Pittsburgh, Pennsylvania.

The health club functions as a student activity in the student government organizations of the school. The student board of health consists of one representative, known as a health officer, from each report room, elected by his class. These representatives meet twice a month to discuss better living conditions in the school, such as ventilation, temperature, lighting, and sanitation of classrooms and washrooms. They also make a definite study of some phase of health, such as food, clothing, bathing and personal habits, safety, and first aid. A teacher who has an earnest interest in health habits is appointed by the principal as faculty adviser of the organization. The objects of the organization are stated in the constitution to be "to stimulate and maintain in the students of the school an earnest interest in their personal health and hygiene; to aid all students in the formation of proper health habits; and to secure better living and sanitary conditions in our school and community."

The constitution provides for the usual officers and defines their duties, and also provides for three regular committees:

> The safety committee, with the vice-president as chairman, shall promote all safety measures of the school. It shall take necessary precautions to make all phases of school life free from possible injury and accident.
>
> The sanitation committee shall supervise all sanitary conditions in the school and investigate and report on cleanliness of washrooms, toilets, halls, and streets adjacent to the school.
>
> The publicity and research committee shall, when necessary, conduct general health campaigns in the school; it shall have charge of posting all health material and shall have published in the school paper and otherwise, the work of the club. It shall also prepare and present new topics for discussion at each meeting of the board.

Article VI, on classroom organizations, states that "each individual class, under the direction of its respective health officer, and with the guidance of the classroom teacher, may select

a local room health committee, whose duty it shall be to promote the work of the board in that respective room."

Given an earnest, alert, and well informed faculty adviser, and a group of teachers in the several rooms who are alive to the dominant importance of health as an educational objective, it would be difficult to conceive a more effective plan of awakening in high school students an appreciation of the value of sanitation and hygiene and an intelligent comprehension of the methods of attaining individual and community health than is afforded by this plan of a student board of health. Such training makes for useful, dependable citizenship. J. M. D.

## "THROW AWAY YOUR GLASSES"—A FALLACY

IN the September number of *Hearst's International* appears an article by W. H. Bates, M.D., entitled "Throw Away Your Glasses." The author claims that by exercise of the eyes and of vision, combined with exposure of the eye to intense light, any eye with sight that is imperfect because of an error of refraction may be trained to perfect vision. The article is illustrated with photographs that would have no bearing on the subject were they not liberally labeled. Almost twenty years ago, according to available reports, Dr. Bates performed some experiments in a laboratory in New York City. He focused light on the eyeball and endeavored to prove that the reflected image of this light changed its size and shape, depending on whether the eye was looking at distant or at nearby objects. The experiments were apparently limited in number, crude in technic, and extremely unconvincing in results. From these experiments Dr. Bates deduced the hypothesis that imperfect sight results from strain of the muscles that move the eyeball within the socket, and consequently all strain and imperfect sight may be relieved by rest and exercise. That this is manifestly an absurdity is patent to any one with a knowledge of the anatomy of the eye and the laws of light. But the article is written with such an assurant note that it may sound convincing to one who lacks the knowledge of the true conditions. The blatant misstatements in the article average at least four to every column of type; in fact, they are so numerous that it would require a volume alone to refute each one by absolute proof. Casual reference is frequently made to cases that had come under the author's observation, but details—and particularly the unpleasant details of the cases—are not given, so that each case appears to be a brilliant success for the Bates method.

It is very unfortunate that this article was given publicity. Much harm will be done by the blind acceptance of the dictum "Throw Away Your Glasses." It is no doubt true that some persons might discard their glasses without harm, but what about the near-sighted children whose near-sightedness, without proper glasses and supervision, will continue to increase to a point approaching blindness? What about the cross-eyed children whose cosmetic defect could, in many cases, be relieved by the proper glasses without resorting to surgery? What about those unfortunate victims of excruciating headaches whose pains are relieved only by properly fitted glasses? What about the patient with serious disease of the eye, manifest to him only by poor sight, whose vision could be saved by timely medical skill, but who is deluded by this article into the belief that his vision will improve with exercise, until it is too late and he is condemned to utter blackness for the rest of his life? That is the sad phase of the publication of such an article of untruths!

If the reader is assured by his occulist that the condition of his eyes is not serious and that his vision will not be jeapordized by temporarily discontinuing the use of glasses, he may try the theory advocated by Bates and convince himself of its absolute fallacy. Upon the return of the condition that originally necessitated glasses—it is assumed that the glasses were fitted by an oculist and not by an optician who is merely in the business of selling glasses—the reader will agree that such an article is not only unfortunate, but also actually dangerous. H. S. G.

## POISONING FROM VIRGINIA CREEPER

VIRGINIA creeper, sometimes called five-leaved ivy, woodbine, and American ivy, is a beautiful climbing plant much used by gardeners and householders for covering the walls of buildings. In summer the foliage is deep green and very dense. In autumn it becomes a magnificent crimson. The fruit, which ripens in October, is a small bluish-black berry. It is known not to be edible, but ordinarily it is not considered poisonous. In the last few years a number of small children have been poisoned from eating the berries, however, and some of them died. The symptoms reported were like those caused by poisoning from oxalic acid, and analysis of the ripe berries has shown considerable amounts of that substance. Oxalic acid is

dangerously poisonous; sixty grains has caused the death of a human being. Parents and teachers should be aware of the potential danger in Virginia creeper. Small children in particular should be watched lest they pick and eat the attractive berries. L. E. W.

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## AMBASSADOR WALTER HINES PAGE: AN APPRECIATION

ONCE in a while a real statesman reveals his inner thoughts; and even though the revelation may appear posthumously, it shapes and molds the future thoughts of others and thereby makes for progress. It is a satisfaction for those who are accustomed to render decisions on the basis of facts and evidence to know that the true and great leaders of men are not given to hurried opinions, prejudices, and gullibility. Their attitudes, judgments, decisions, and actions are arrived at only after mature deliberation and analysis, and these are reflected in their labors and accomplishments.

Such is the record of our late ambassador to the Court of St. James, the Honorable Walter Hines Page, who, though perhaps less well known than those whose names are daily blazoned in the head lines of newspapers, reveals with amazing frankness and plain speech in his remarkable memoirs the great and important rôle he played in the events of our country during the last two or three decades. The Life and Letters must be read and studied to be appreciated; the letters abound in comments on important persons and questions of the day. They reveal the powerful influence of this man in the political, social, and educational tendencies of his country, exerted quietly and unostentatiously, his genius, versatility, and plain common sense. Without an attempt to interject the merits of the controversies pertaining to the teaching of evolution and the influence of science on modern thought in general, passages written in the days of 1914 are quoted because of their immediate interest and application.

> Again and ever I am reminded of the danger of having to do with cranks. A certain orderliness of mind and conduct seems essential for safety in this short life. Spiritualists, bone-rubbers, anti-vivisectionists, all sorts of antis, in fact, those who have fads about education or fads against it, Perfectionists, Daughters of the Dove of Peace, Sons of the Roaring Torrent, itinerant peace mongers—all these may have a real genius among them once in forty years; but to look for an exception to the common run of yellow dogs and damfools among them is like opening oysters with the hope of finding pearls. It's the common man we want and the uncommon common man when we can find him—never the crank.
>
> We're in danger of being feminized and fadridden—grape juice (God knows water's good enough: why grape juice?); pensions; Christian Science; peace cranks; efficiency—correspondence schools; aid-your-memory; women's clubs; co-this and co-t'other and coddling in general; Billy Sunday; petticoats where breeches ought to be and breeches where petticoats ought to be; white livers and soft heads and milk-and-water. . . .
>
> This present order must change. It holds the Old World still. It keeps all parts of the world apart, in spite of the friendly cohesive forces of trade and travel. It keeps back self government and the progress of man.
>
> And the tropics cry out for sanitation, which is at first an essentially military task.
>
> The new sanitation will reclaim all tropical lands.

A seer and prophet of the events of the war that was to be and the part that the United States was to play, Page possessed the gift of sharp acumen, and was able to outline the strategy and policy of our country in the World War before it was waged. As member and guiding light of the old Southern Education Board, of the later General Education Board and of the Hookworm Commission, promoter of good hygiene and the welfare of the people, friend of science, educational statesman, and no less a medical statesman, democrat, philosopher, and diplomat, Walter Hines Page was indeed a worthy and great citizen.

If it is feared that the civilization and educational tendencies of the present go backward, cheer may be taken from the words and acts of our true statesmen—and not from near statesmen, would-be statesmen, pseudostatesmen, and just plain quacks.

"By their fruits ye shall know them."

P. J. H.

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## THE STRENGTH OF INSECTICIDES FOR ANIMALS—A CORRECTION

IN the article, "Fleas and Lice," published in the July number of HYGEIA, the statement was made on page 240 that a 3 per cent. compound solution of cresol may be used in washing pet animals. Exception is taken to this statement by a prominent veterinarian, who calls attention to the fact that this solution seems too strong for some animals. It would probably prove irritating to the skin of some dogs and cats. Consequently it is well to bear in mind, if one has occasion to use an insecticide of this type, that some animals, like human beings, are especially sensitive to strong solutions, which should therefore be used with care. The veterinarian in question suggests that a solution not stronger than 1.5 per cent. be used for the purpose. This will probably be of sufficient strength to kill the fleas.

# HEALTH NEWS AND VIEWS

## DANGERS OF CONCENTRATED LYE, OTHER CAUSTIC ALKALIS, AND CORROSIVE ACIDS

The medical profession is aware of the danger of concentrated lye and similar substances. The House of Delegates of The American Medical Association at its annual meeting at San Francisco passed the following resolutions:

WHEREAS, The domestic use of concentrated lye and other caustic alkalis and corrosive acids, in ignorance of their dangerous properties and of treatment in case of accident, is not infrequent cause of death and of prolonged, distressing and incurable disability, particularly among children; and

WHEREAS, In the judgment of this House, the adoption of suitable methods of packing, labeling and distributing such substances would materially diminish the danger; and

WHEREAS, Efforts to bring about the adoption of such methods by the voluntary action of manufacturers and distributors have given no prospect of success, be it

*Resolved*, That it is the sense of the House of Delegates of the American Medical Association, in convention assembled, that in the interest of public health and safety the packing, labeling and distribution of concentrated lye and of other caustic alkalis and of corrosive acids should be regulated by law; and be it

*Resolved*, Further, that the Board of Trustees be instructed to take such action as may be necessary to procure the enactment of such federal and state laws as may be necessary to effect such regulation.

People of every state should demand of their legislatures the enactment of laws compelling suitable methods of packing, labeling, and distributing such substances.

## INFANT MORTALITY IN BALTIMORE

The extensive investigation of infant mortality and its causes in Baltimore, which was recently conducted by the United States Department of Labor through the Children's Bureau, reveals many facts of vital importance to individual and community health. Poverty, employment of mothers outside the home, housing below the proper standard, short intervals between births, and the deaths of mothers at, or soon after, childbirth were among the conditions causing high death rates in certain groups. Congestion and lack of sanitary equipment in the homes were accompanied by death rates above the average. In most cases the infant mortality rose as the father's wages fell. Among breast-fed babies in every group of the population the mortality was lower than among the artificially fed babies of the same group.

## AUTO CAMPS AND SANITATION

Automobile touring has increased so extensively as to make necessary the establishment and maintenance of "auto camps" by the cities along the most traveled highways. Sanitation is a matter of such importance in these camps that the department of health in each state is devoting much study and thought to the control of the sanitary conditions. The problem differs in the several states and the regulations vary accordingly. Some states entertain the automobile tourist for a day or two only, while other states are hosts to the tourist for two or three months. Florida is among the latter hosts and is seeking to protect the health of her citizens and visitors by putting into effect modifications of the existing regulations embodying the following points:

Every city, town, or person contemplating the erection or installation of an automobile camp shall previously submit complete plans thereof to the state board of health for examination and approval. If the plans and site are approved, a certificate will be issued.

Certified camps will be listed at frequent intervals in the press of the state for the guidance of visitors.

Camps which do not comply with the strict rulings of the board will be regarded as public nuisances and handled accordingly.

The improperly equipped, menacing camp will rapidly disappear if similar regulations are enforced in all states.

## THE PUSH-CART EVIL

An active campaign against the unsanitary methods employed by push-cart venders of cold drinks and candies has been instigated by the commissioner of health in New York City. An order recently issued insures protection against inadequate cleansing of drinking glasses by specifying that only single-service containers, preferably paper cups, be used. A determined effort to enforce existing regulations which require that candies be wrapped or otherwise protected from flies and dirt is a feature of the commissioner's order.

## GOVERNMENT PAMPHLETS ON CHILD HEALTH WORK

The United States Public Health Service has prepared and offers for sale through the Government Printing Office at cost price numerous publications which are of service in the care of infants and children. The list includes among others:

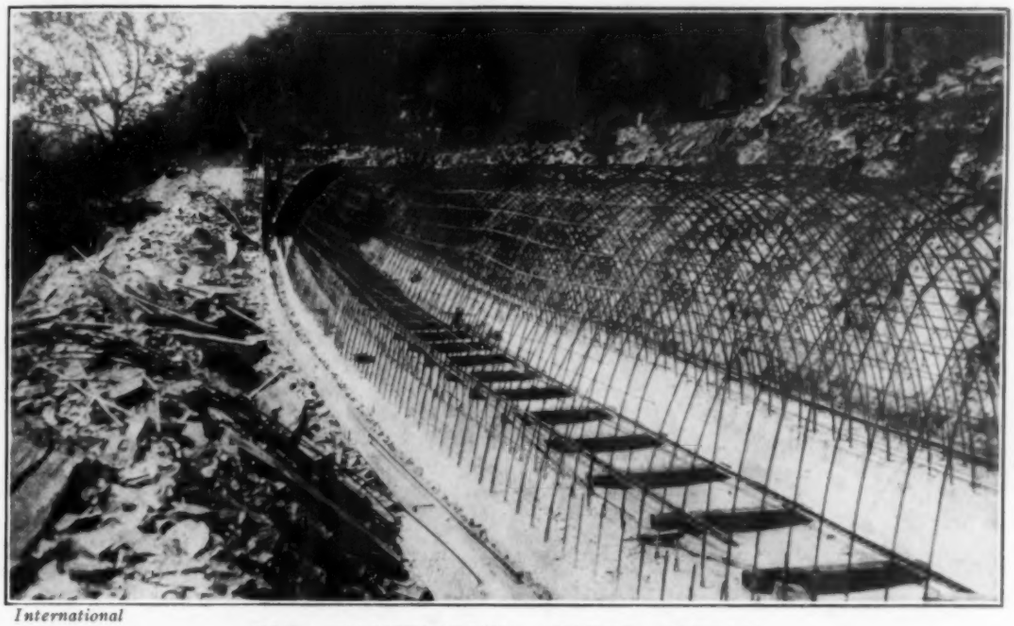
Children's Teeth, a Community Responsibility.—This is a pamphlet of nineteen pages dealing with the causes of decay in teeth and presenting a practicable plan for carrying on preventive and corrective work.

The Fate of the First Molar.—This is a six-page pamphlet emphasizing the importance of caring for the temporary teeth and of watching the first permanent molar for decay. It is pointed out that this tooth is most often found to be carious.

Good Teeth: The Importance of Good Teeth and the Prevention of Decay.—The care of the teeth, both temporary and permanent, is described, and it is pointed out how diseased teeth may cause serious illness. The pamphlet contains ten pages.

The School Nurse: Her Duties and Responsibilities.—In fifteen pages, a brief review of school health supervision is presented with a useful outline of the duties of the school nurse.

The Care of Your Baby.—This pamphlet is somewhat larger than the others of the series; it contains forty-one pages. It presents in popular form instructions concerning the prenatal care of the mother, but deals principally with the care and feeding of the baby.



*International*

FOR WASHINGTON'S WATER SUPPLY

Beneath this steel cage of the new conduit, water is to be carried to the capital city. The source of supply is Great Falls, Maryland; the water is to pass through a modern filtering plant in the District of Columbia before it reaches the people of Washington. Pure water is one of the essentials to health, a fact known to the ancients. Some of the aqueducts constructed centuries ago still command wonder and admiration.

*International*

FIRE! FIRE!

A million ice cream cones were recently condemned by the health authorities of Boston to destruction by flames so that they could not cause sickness to possible consumers. Most of the cones were found to be five years old. Who wants to eat them now?

*Keystone*

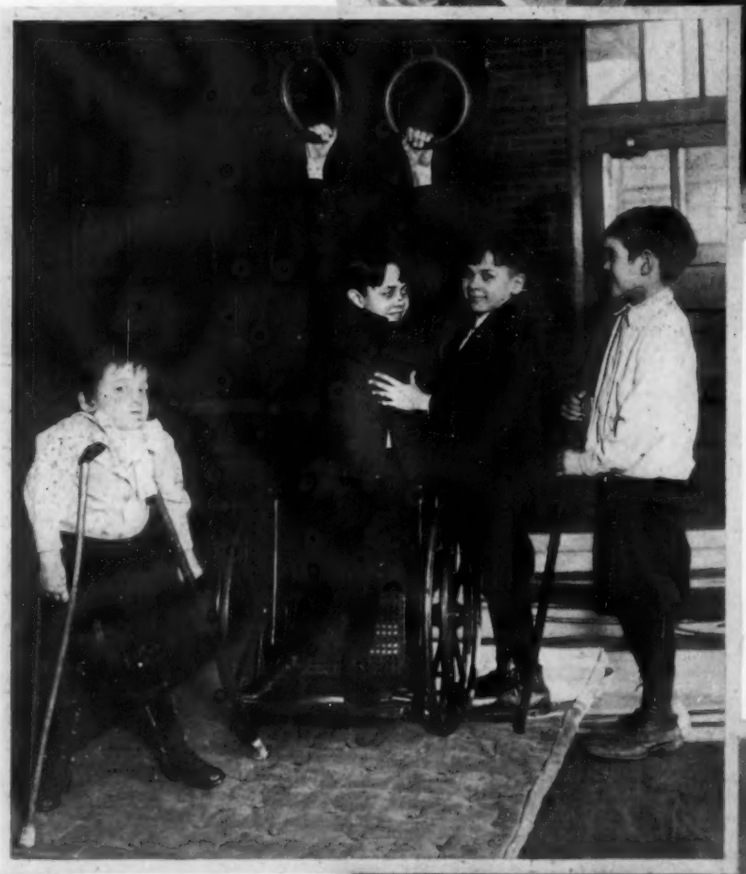
THE CHEF ON INSPECTION

In a New York hotel a health attendant passes on the cleanliness of all persons who handle food. This is a phase of health work that should become a general custom.

### AN ANGEL IN DISGUISE

A Ringling Brothers' circus clown is a great event in the lives of children who constantly lie on boards to give rest to tuberculous backs or wear braces because their muscles have been made useless from infantile paralysis. Yet unexpected visits to the wards of the hospital home of these children find them happy on eventless days as well.

*Underwood*



*Underwood*

### A PUBLIC SCHOOL FOR CRIPPLED CHILDREN

In the Spaulding Public School, Chicago, which is exclusively for crippled children, are three hundred students—and happier ones you never saw. The teachers report them also to be good students. They are encouraged to specialize in some branch of study that will make them self supporting. They do not need to be encouraged to do their best at games and sports.

### CAN'T YOU HEAR

these hungry youngsters relishing the soup served them at a Brooklyn school by the community free lunch counter for children of little means?

*Pacific and Atlantic*

*Underwood*

BAND OF BLIND WAR VETERANS

At the State Hospital for the Blind at Jacksonville, Illinois, these veterans of the World War have been organized into a band. The Braille system of raised notes is used in learning new selections. Certainly the persistence of the men must be rewarded by their pleasure in being able to gather for a music fest and forget.

*Des Moines Register and Tribune*

A PYRAMID OF BLIND BOYS

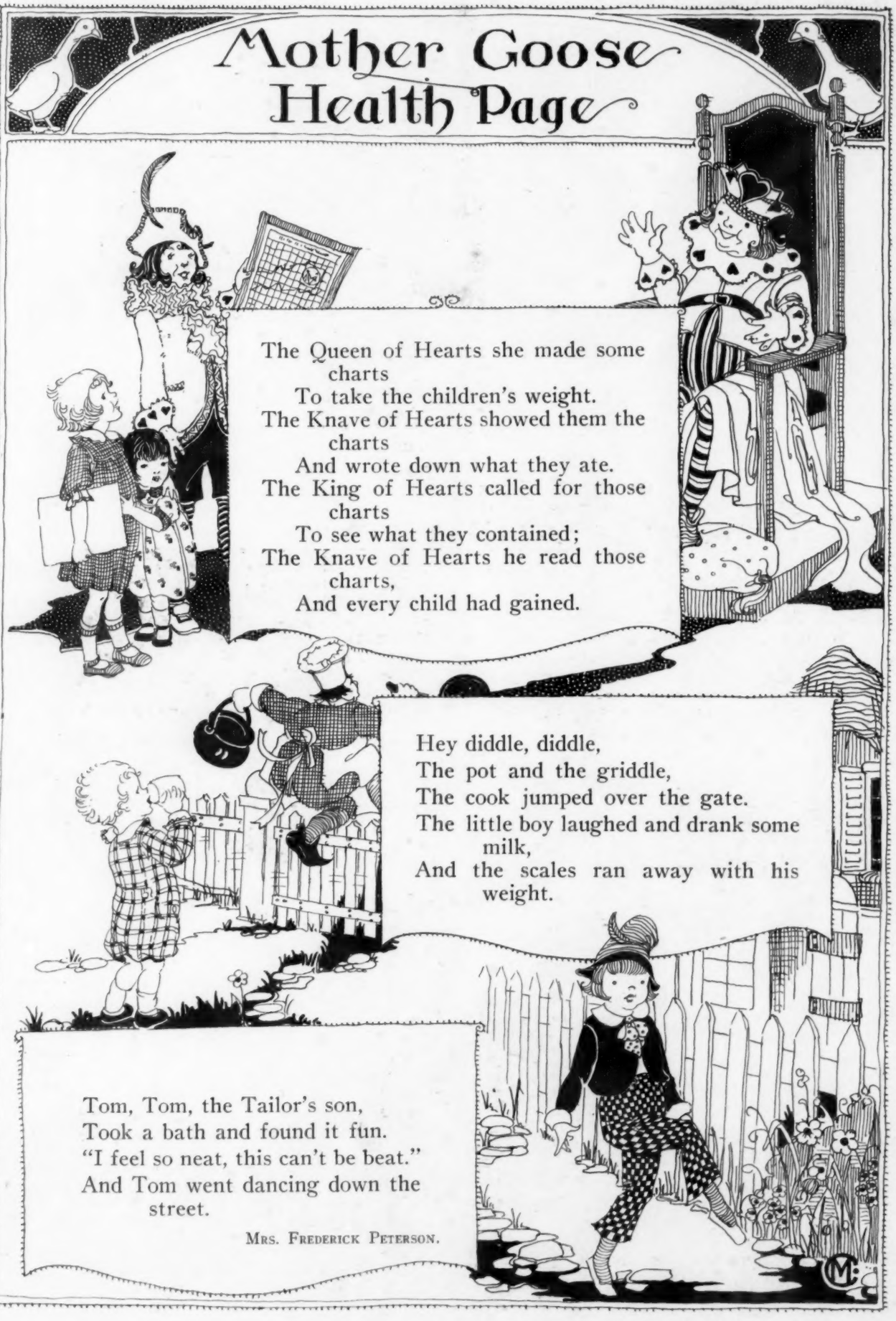
With all the agility of their more fortunate brothers, these students of the Iowa School for the Blind perform feats of physical strength.

*Des Moines Register and Tribune*

THE HIGHLAND FLING BY BLIND GIRLS

The girls at the Iowa School do the Highland Fling with grace and accuracy. Through patient training by teachers and their own will to do, the physical handicaps of these girls do not keep them from enjoying all of the healthful pleasures of their generation.

# Mother Goose Health Page

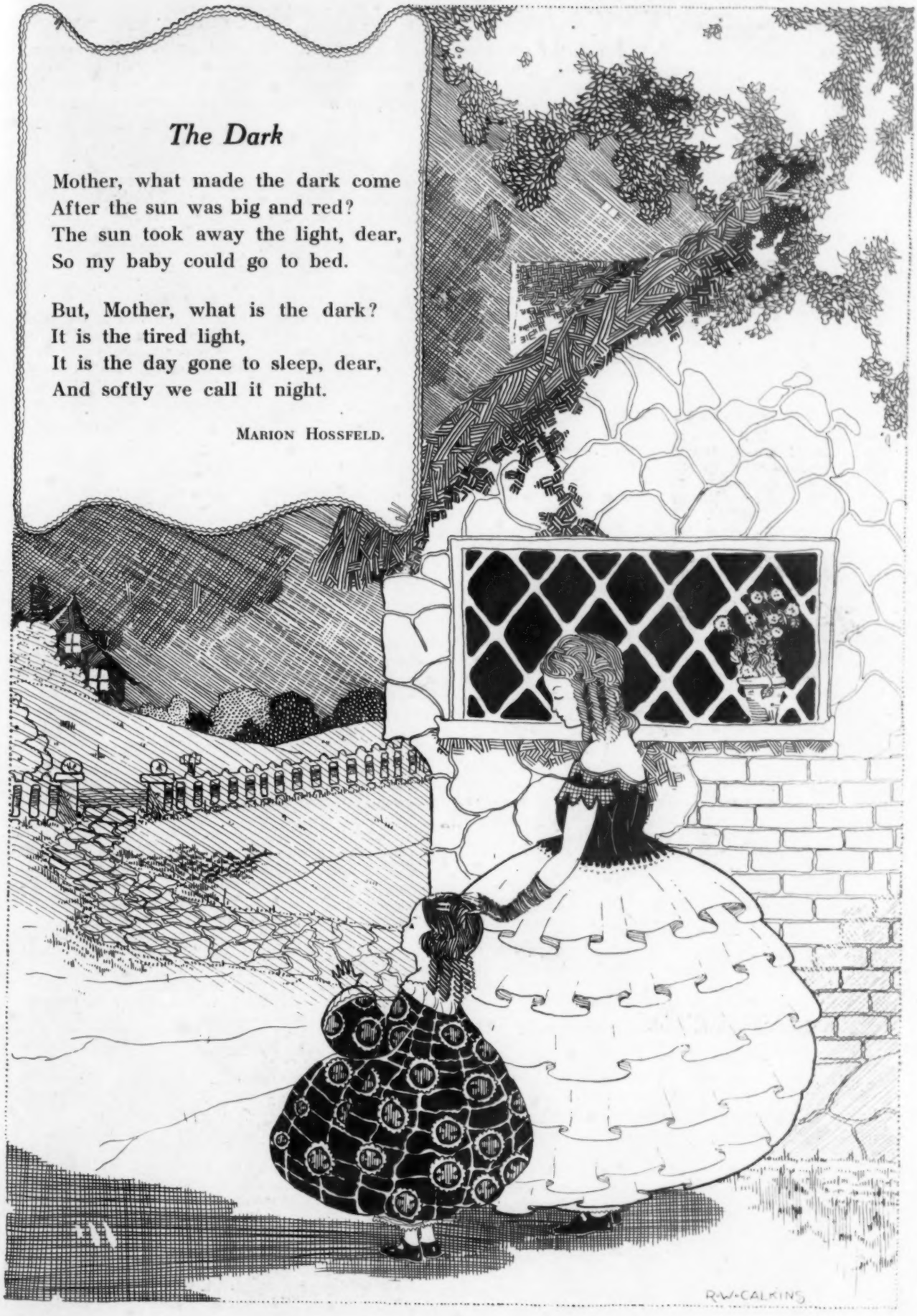


The Queen of Hearts she made some charts
To take the children's weight.
The Knave of Hearts showed them the charts
And wrote down what they ate.
The King of Hearts called for those charts
To see what they contained;
The Knave of Hearts he read those charts,
And every child had gained.

Hey diddle, diddle,
The pot and the griddle,
The cook jumped over the gate.
The little boy laughed and drank some milk,
And the scales ran away with his weight.

Tom, Tom, the Tailor's son,
Took a bath and found it fun.
"I feel so neat, this can't be beat."
And Tom went dancing down the street.

MRS. FREDERICK PETERSON.


The Dark
Mother, what made the dark come
After the sun was big and red?
The sun took away the light, dear,
So my baby could go to bed.
But, Mother, what is the dark?
It is the tired light,
It is the day gone to sleep, dear,
And softly we call it night.
MARION HOSSFELD.
R.W. CALKINS

# QUESTIONS AND ANSWERS

*If you have a question relating to health, write to "Questions and Answers," HYGEIA, enclosing a two-cent stamp. If the question is of general interest, the answer will be published; otherwise it will be sent by mail. The names of correspondents will not be published. Diagnoses in individual cases will not be attempted nor treatment prescribed.*

### Three Stages in Tuberculosis

*To the Editor:*—How many stages are there in tuberculosis? G. M., New Jersey.

*Answer.*—Three stages in tuberculosis are usually recognized—a primary, or beginning stage; a secondary, or moderately advanced stage, denoting a progression of the disease process in the lung; and a tertiary, or far advanced stage, indicating a more or less extensive involvement of the lungs. This schematic classification is based on the physical signs and symptoms at the time of the patient's examination.

### Electric Fanning During Sleep

*To the Editor:*—There is a popular impression that the use of an electric fan for sleeping purposes is an unhealthful practice, despite the fact that sleeping might be practically impossible without it. I should be pleased to have you discuss the merits or demerits of such a practice through your columns. J. W. R., Arkansas.

*Answer.*—The use of an electric fan in a sleeping room, especially if it produces a constant movement of fresh air from outdoors and a discharge of breathed air from the room, is certainly conducive to health. One of the well established facts in reference to ventilation is that moving air is conducive to comfort and health, provided the current of air as it comes in contact with the body is not so strong or so cold as to result in sudden chilling of the surface.

Certain pernicious effects are directly traceable to the pronounced chilling of the body surface; for instance, Bell's palsy, a paralysis of the facial nerve, is directly caused by a chilling of the nerve as it comes near the surface of the cheek. Lumbago, rheumatism in the muscles of the back, may be so caused, as may many of the so-called rheumatisms of the other muscle groups. The fan should therefore be arranged so as not to project a strong current of air on any portion of the body.

### The Allen Goiter Treatment

*To the Editor:*—My wife has a bad goiter. A few weeks ago an oily-tongued salesman nearly induced her to take Dr. C. J. Allen's Goiter Treatment. Since it is a patent medicine and treats a very serious ailment, I question its real value, especially since the full treatment is $90. The preparation is made by the Allen Remedy Company, Sheffield, Iowa. I would greatly appreciate receiving any information you can give me in regard to it. C. B. S., Wisconsin.

*Answer.*—The "Dr. C. J. Allen's Goiter Treatment" was dealt with in some detail in *The Journal of the American Medical Association* for February 24, 1923. C. J. Allen, who has been dead for several years, never seems to have made a single contribution to scientific medical literature. His alleged goiter treatment consists of sixteen four-ounce bottles for which $90 is charged. The purchasers are especially instructed to "massage the goiter both morning and evening" and are told that "this is very important." One of the testimonials for the nostrum purports to be from a "Dr. G. W. Lee." Lee, as a matter of fact, is an employee of the company. The "goiter treatment" was analyzed in the chemical laboratory of the American Medical Association and was found to consist essentially of iodide of iron and hydriodic acid. In closing the article on this preparation *The Journal* said:

"The profits made from selling four pints of a syrup of ferrous iodide and hydriodic acid for $90 must surely not be inconsiderable. This, however, is a minor indictment. The most serious feature of the business is the viciousness of the indiscriminate sale of an iodide mixture to those who may be and are likely to be suffering from exophthalmic goiter. Add to this the pernicious suggestion that the victim should massage the thyroid daily and it is not surprising that physicians are beginning to report serious results from the use of this preparation."

### Inecto-Rapid

*To the Editor:*—There is on the market a hair-coloring preparation which is called "Inecto-Rapid," which I am most anxious to know about, especially as to its harmfulness. E.D., Illinois.

*Answer.*—This hair dye consists of a coal-tar preparation known as paraphenylendiamine. A large number of cases of poisoning following the use of hair dyes containing this substance have been published in medical literature. Damage suits for injuries produced by "Inecto" have been brought in British courts, and judgments obtained. The newspapers have reported that a woman in New York who brought suit against Inecto, Inc., charging that the use of Inecto-Rapid had caused her to lose patches of hair and also one eyebrow, was awarded $2,000 damages. The Department of Health of New York is said to prohibit the use of paraphenylendiamine in hair preparations. The United States Public Health Service in one of its reports says: "Paraphenylendiamine is an aniline derivative, which by oxidation becomes black or brown. The poisonous qualities of this chemical are well known. A number of cases of poisoning from the use of the compound as a hair stain and even from wearing hose dyed with this chemical have been reported."

### Is Gonorrhea Curable?

*To the Editor:*—1. What is gonorrhea? 2. Is it incurable, as syphilis is, or is it more amenable if treated in time? 3. How is it contracted? 4. By "contracted" I mean, is one able to contract it in any other way than sexually? 5. Are there any especial symptoms by which one may recognize it? 6. Is it considered as much of a menace as syphilis? 7. Is it inherited? K. Z., Indiana.

*Answer.*—1 and 5. Gonorrhea is the process by which human flesh destroys and expels invading microscopic plants called gonococci. One feature of this defense is the formation of pus. A constant symptom of gonorrhea is therefore the production of pus.

3 and 4. The smearing of a fluid containing gonococci upon a susceptible mucous membrane is followed in a few days by suppuration of the invaded surface; the only susceptible surfaces are the genital canal of each sex, the covering of the eyeball, and sometimes

the rectum. The usual means of inoculation are sexual intercourse, the passage of the child through the canal of an infected mother in childbirth, and the unwitting transfer of pus from genitals to eyes; the passage of infected instruments, such as a douche-bag nozzle, into the genital canal is a less frequent means; contact of genitals with pus left on a toilet seat is a possible way.

2. As the genital canal in the male is accessible to local treatment, gonorrhea in men is with few exceptions curable; and it is easy to prove that it is cured. In the female, much of whose genital canal is inaccessible to local treatment, the results of treatment are uncertain, and the proof of cure difficult. There is at present no test by which the cure of gonorrhea in the female can be demonstrated during life.

6. Life insurance companies do not regard a history of gonorrhea as a bar to the acceptance of an applicant, but a history of syphilis excludes him from certain policies and raises the cost of others, for their records show that the average life of a person who has contracted syphilis is distinctly shorter than is that of the nonsyphilitic person. Syphilis seems to cause more deaths in our race than does any other infectious disease, with the sole exception of tuberculosis. The mortality from gonorrhea is insignificant, but the disease is transmitted to many women and is responsible for a large proportion of the infections of the genital tract in women, many of which require operation. The inflammation of the eyes during birth of babies whose mothers are so infected causes from one seventh to one twentieth of all the cases of blindness in this country.

7. Gonorrhea is not inherited.

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### Rexall Orderlies

*To the Editor:*—Of what are Rexall Orderlies composed? Is their use advisable?

M. A. P., Colorado.

*Answer.*—"Rexall Orderlies" were analyzed a few years ago by the state chemists of Connecticut. They reported that the laxative drug in this preparation was phenolphthalein. This drug is very widely used in "patent medicines" of the laxative type. While it may occasionally be permissible or even necessary to use laxative or purgative drugs, their continued use is harmful to a degree. The rational way of overcoming constipation is by regulating habits and diet.

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### Hair Removers—Mi Rito, Zip, Annette Lanzette

*To the Editor:*—I am troubled with undesirable hair on my face and body. Is there any harmless way to get rid of this trouble entirely? Is it dangerous to use Mi Rito, Zip, Annette Lanzette Hair Remover? Could any of these cause skin cancer?

E. G., Wisconsin.

*Answer.*—There is a general impression that shaving and the use of depilatories cause an increased growth of hair. It is very difficult to be sure about the accuracy of such impressions; the experiments that have been made do not bear out this impression. It cannot be said with certainty, therefore, that depilatories such as you mention stimulate the growth of hairs. It is certain that they do not diminish the growth. Shaving is just as good a method of getting rid of hairs. A better way is to pull them out with a pair of tweezers one at a time, for this damages the follicles and may tend to diminish the subsequent growth of the hairs.

We do not know the composition of "Mi Rito," "Zip," and "Annette Lanzette Hair Remover." In general it may be said that the so-called hair removers are divided into two types. One type depends for its effect on some strong solvent of horn, an important constituent of hair. These are nearly all made with barium sulphide, which is a strong irritant to the skin. Not infrequently, therefore, they produce irritation of the skin that at times is troublesome. After the use of hair removers, the hairs return because the hair follicles are not destroyed, and in due time they are more liable to become coarse, as in shaving. The other type of hair removers simply entangles the hairs, which are pulled out when the preparation is removed. Some of the hair follicles treated in this way are destroyed, but many of them are not. These remedies are not without danger.

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### Variations in Blood Pressure

*To the Editor:*—What is the cause and remedy of a varying blood pressure? It varies between 79 and 150. The person in question is twenty years old.

J. N., Louisiana.

*Answer.*—By a blood pressure reading one is able to determine systolic and diastolic pressures. The systolic is the pressure in the arterial system at the time of the heart beat, the diastolic in the interval between heart beats. Average blood pressure readings in a person twenty years old are 110 to 120 systolic and 80 diastolic. The systolic blood pressure naturally varies considerably, being increased by whatever factors increase the rate and force of the heart beat. The diastolic pressure is less variable. A single blood pressure reading represents merely the pressure at a given time. Since variation of blood pressure is normal, there should be no question of a remedy.

From the data supplied it is impossible to determine whether the figure 79 represents the diastolic pressure, or whether both figures represent systolic pressures existing on different occasions. A systolic pressure of 150 for a person twenty years old seems high, yet it might normally be present after exercise or excitement.

Blood pressure variations are normal and are susceptible to the same influences as the pulse rate and volume. To determine whether the blood pressure itself or its variations are abnormal requires general consideration of the person by a competent physician.

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### Operation for Enlargement of Nose

*To the Editor:*—Is an operation to reduce an excessive prominence of the nose safe? Who are some specialists in that line?

P. B., California.

*Answer.*—Operations to remove excessive tissue that disfigures the nose are done very successfully by competent surgeons with experience in what is called plastic surgery. It is not possible for us to give the names of surgeons in this line; they can be secured by consulting the secretary of the medical society of your county.

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### Cure of Syphilis

*To the Editor:*—Please inform me as to whether there is a positive cure for syphilis.

H. R. H., Michigan.

*Answer.*—Yes. When syphilis is discovered in the earliest stage, it can be cured in practically all cases. When it is not discovered, or when treatment is neglected until the later stages, the cure requires several years' treatment, and a small percentage of cases are never cured. Many of these are clinically cured, however, that is, the symptoms are cleared up, and the patients, by care, can maintain themselves in apparent good health. Syphilis responds readily to treatment; it can quickly be put under control and easily held there.

# HEALTH REVIEWS

## HEALTH IN THE CURRENT MAGAZINES

### THE DELINEATOR

In the *Delineator* for September, Mr. Yost, director of athletics and physical education, University of Michigan, continues his discussion, "How Sports Develop Character." He believes that every boy should engage in competitive athletics because of its value, first, to the individual and, second, to the group of which he is a part. "It is easy to see that a boy might have good health, good morals and a strong mind and still not fit in well with a group. Sports that make him more adaptable and more inclined to adopt the ideas of teamwork are serving the whole group as well as the individual. They will teach him to think 'in a pinch,' to keep cool in trying situations, to control his emotions."

There are four qualities which a boy must develop to excel in athletic competition; first, good health or condition; second, learning to think under fire; third, the spirit of fair play and give and take; and fourth, the determination to do and the will to give service. These qualities might be developed by other means, but the intense desire to become and to remain a member of a successful competitive team offers the most potent stimulus to the development of these qualities.

"There are four principal causes of victory in athletic contests, and if you take care of causes the results will take care of themselves." These causes are thorough preparation in the individual and in the group, coordination and cooperation, unswerving loyalty, and the realization that service produces results. "The boy or man who makes up his mind to give service has found the key to success. Service in any activity of life is not self-sacrifice in the sense that it precludes a reward; it is the only sure method yet discovered of bringing a reward."

Mr. Yost regards football as the most typical of what a competitive game should be, hence its popularity. In baseball only three or four of the players are in action at any one time; in football the entire team must be in every play on the offensive, and practically all on the defensive side during an open field maneuver.

Mr. Yost says that luck is sometimes a factor in football, but that in the long run good luck and bad luck balance and the better team wins. There have been and probably always will be abuses of the opportunities presented in football, but these are becoming less frequent, and institutions that put victory above principle, refuse to abide by the elegibility rules, and permit foul play and dishonesty, are finding themselves more and more isolated.

According to Mr. Yost, the dangers of football are not nearly so great as many people are led to believe, and in properly supervised school or college teams with good training and coaching they are far more than offset by the advantages. A boy of frail physique or organic weakness, however, should not attempt to play football.

The fighting instinct is present in every boy and should be given an outlet. "Your boy is not showing vicious traits because he likes rough play better than being 'dressed up'; he is being human. He isn't necessarily proving himself a quarrelsome and dangerous character when he fights; he is finding an outlet for an instinct not to be curbed, but to be directed into proper channels."

The boy who has conquered himself will not be looking for trouble, but will be quick to take up the cudgels in behalf of the oppressed.

Dr. L. Emmett Holt writes of "The Happy Child—Sweets Have Their Place in the Children's Diet," defining sweets as candy and the sugar and syrups used in the preparation of food or served with it.

The author gives answers to these questions: Have sweets any real value as foods? May they form a desirable part of the diet? If so, why are doctors and dietitians constantly preaching against them? In what circumstances may they be harmful? Finally, if their use is approved, what is a proper allowance of sweets for a normal, healthy child?

All of the three classes of foods, proteins, fats, and carbohydrates (starches and sugars) are essential in our diet. The carbohydrates are burned in the body as sugar to furnish heat or they are changed into fat. They are, moreover, the cheapest and most easily digested of our foods. The consumption of sugar in the United States has increased rapidly from eight pounds to every dozen persons a century ago to more than one hundred pounds in 1922; it exceeds that of any other country except Australia. Italians consume less than one sixth as much as we do. The large use of sugar is said by some of the foremost authorities to be an important factor in the production of diabetes. For children, as for all other growing animals, a properly balanced ration results in the healthiest adults; an excess of carbohydrates does not produce strong vigorous bodies. Children like sweets, and mothers are prone to give their children what they like rather than what they need. Such a practice leads to bad habits and children soon come to refuse the foods that are best for them unless they are sweetened with an excess of sugar. With its appetite satiated with sweets, a child fails to get the amount of the proteins and fats that are essential to the building of firm bone, muscle, and nerve.

The mother is not the only offender, for the indulgent father, the grandparents, and other members of the family, eager to please the child, give it sweets on the sly, or money to buy them. Children pampered in this way are often considered "delicate," "very susceptible to colds," or they have "little ambition for active sports." These conditions develop slowly, and are therefore not recognized early enough to be prevented. Decay of the teeth is much increased by excess of sweets unless great care is taken to keep the teeth clean. Some interesting observations in New Zealand have demonstrated this fact.

Sweets are useful food, but great care must be exercised in their use. The desire of children for sweet food is no guide whatever as to what the quantity should be. Sweets should be taken with meals and not between meals; for children with digestive disturbances and poor appetites they should be very small in amount; and in many cases they should be excluded from the diet.

For a healthy child of nine or ten years, a moderate allowance of sugar or candy is as follows:

"Of sugar on cereals, one even teaspoonful at breakfast or supper, and not more than this on fresh or stewed fruit; of candy, one piece with the midday meal; of ice cream or fruit ice, one good tablespoonful once a week, possibly twice in summer; of ice-cream

sodas, not more than one a week." In cookies and plum cake, gingerbread, custards, and puddings, enough sugar will ordinarily be added to bring the total allowance to two tablespoonfuls of sugar a day, a safe allowance for the healthy child of that age. Unless the child's appetite for sweets is easily controlled and directed, it is almost certain to acquire a craving and habit of excessive use that will long adhere.

"The indulgence of children does not tend to produce the best results physically or morally. Self-control and moderation here will be of service in teaching these virtues in other matters later in life."

In "Summer Weather Calls for Melons," Lucile Brewer and Alice Blinn present a baker's dozen of recipes for such good things as "Melon Mallows," "Cantaloup Salad," "Cantaloup Butter," and "Watermelon Conserve."

"The Well-Equipped Bathroom" is portrayed by Mrs. Charles Bradley Sanders in a way to invite frequent use of this small but very important room of the modern home. The various materials for walls and floors, the tub of porcelain or enameled iron, preferably "built-in," the various types of shower baths, are described briefly, but adequately, as well as the closets, wash bowl, cabinet or shelves, and the numerous items of modern bathroom equipment that the manufacturers of late years have been so diligent in devising. With such a bathroom as the one pictured by Mrs. Sanders, the home builder would be little likely to design the bathroom for only hebdomadal use as did the newly rich contractor of a northeastern city. In a mansion that he had erected on a hill crowning the city, and planned to be the show place of the city, the gorgeous bathroom was equipped with an exquisite procelain tub, "the finest money could buy." An early visitor to the palace observed that a highly polished mahogany lid had been attached to the tiled wall with silver-plated hinges so as to swing down over the tub. On inquiry as to its purpose the owner with much pride answered,

"Oh! that's a little idea of my own; I had that put in to keep the dust out during the week."

### WOMAN'S HOME COMPANION

"The Doctor," by Elizabeth Porter Wyckoff, in the *Woman's Home Companion* for September, is a graphic story of the daily round of a busy practitioner of medicine, which might have been appropriately entitled "A page from the doctor's diary."

"He was barely awake, though he drank his coffee and put the buttons in his clean shirt with apparent intelligence. He was gathering together, as fast as he could after an exhausted night, those forces, whatever they are, that make up a self, putting them by conscious effort into the dynamic thing his patients lived on."

Then he ran through his pockets to make sure that he had all the necessary articles, thermometer, pen, tapemeasure, flashlight, money, stethoscope, and prescription blanks.

Thus, with a good-bye to the family, the day begins, and he is off to call first on the widow of a brother physician, whose life is slipping away with the pulse each day a little weaker, the smile a little slower—a hard visit because he knew there was little he could do. It brought back his own grief, the older physician whom he had known and loved. . . . He stepped in quietly and sat down beside her.

"'You know, Jim,' she said to him, in the same gentle, confiding tone, half-humorous, that she would have used in describing a shopping trip, 'when I woke up this morning and found that I was still here, I was a little disappointed?' Her face took on the smile that always came when she spoke of her husband. 'I don't know exactly what I believe about the future life,' she said, 'but, do you know, I want to see the doctor.'"

On the trip to the hospital, he reflected "I suppose I shall never get used to it, but I wish it didn't get me so. I wish I were hard boiled."

As he entered the hospital a crowd was waiting at the door of the elevator—some medical students full of importance and new knowledge; a woman intern, a passive child on a stretcher, with a nurse and orderly, and one or two older doctors come for their daily rounds. The elevator arrived and the students pushed toward the door. The mild blue eyes, so gentle in the quiet room up-town suddenly blazed with irritation.

"'Anderson,' he barked. 'Levitski. All you fellows see here a minute.'

"They stood aside while the orderly, seizing his chance, wheeled the stretcher on to the elevator.

"'You men may not know any better,' Jim announced, 'but I am now here to tell you, if you don't know it already, that in this hospital the order in which people get on elevators is as follows: First women, any and all women, whether they are nurses, physicians, or visitors; second, visiting physicians; third, men interns. Medical students get on after all others who rank them. They also remove their hats in the presence of ladies. I wish I had had every one of you in the army for two weeks. . . . That's all.'"

Then follows the rounds in an overcrowded hospital, "seven admissions since midnight, and on the whole service there are 120 patients now," says the house physician, a wan boy who had been up all night. The doctor—reflecting on the normal capacity of the hospital, eighty beds—asks how the nurses are standing it.

"Forty-five sick from the whole hospital," is the reply, "but we're well off—only two short."

All the sickest patients are seen, the house reports heard, and the young intern is left visibly relieved.

Then twenty minutes to rush to the office for the regular hours. Not so many patients waiting, but two new ones with obscure symptoms, needing careful history taking and examination; a man who must discuss the merits of six surgeons before deciding on which should do a minor operation for him; a working girl to be told that the laboratory report confirmed the diagnosis of tuberculosis which had been made in her case and who "went off, gamely with her head high." All these took time.

Then a rush to the train for a journey to a suburb in response to a telephone call to see in consultation a young woman six months married, three months pregnant, whom he found hopelessly ill with an acute infection. The ride out was spent in balancing his check book, figuring the month's total of work done, and in deciding what line he would take at a committee meeting the next night.

Returning to the city, a taxicab hurries him to a big marble home where the butler greets him with, "Yes sir, Mr. Gray is better today. Mrs. Gray wants to see you after you have seen Mr. Gray. She is very anxious to see you, sir."

Ten minutes' conversation with the patient, now nearly ready to be discharged, music, the market, a prescription for an eye-wash, and the maid takes him to a little sitting room where Mrs. Gray does her housekeeping. She discusses at some length the difficulties of housekeeping with seven maids, a butler, a housekeeper and two trained nurses, concerning the latter of whom she has complaint to make. "They get linen without speaking about it to anyone, and they like such curious food." The doctor sympathizes, although he knows the nurses to be among the least troublesome, and, although irritated by the complaint, he establishes before leaving the house an atmosphere of cordial cooperation.

One more call at a gilded hotel, on a middle-aged, overweight, jolly, and indolent patient, with whom he must waste a half hour. A 'phone call to his secretary from whom he learns of two more calls that must be made. Another telephone talk with his wife to report that he must postpone dinner and cannot be home until ten o'clock.

The first call, thoroughly enjoyed because an invalid wife had come fairly back to life again through strict diet and frequent tests—a miracle to the family, although so simple to the doctor. The second, a consultation in Brooklyn taking two hours, and finally another visit to the first patient of the morning, taking nearly an hour, during which he permits no trace of weariness or haste in his manner.

At eleven o'clock "he pushed open the door of his apartment, not so forcefully as he had flung it open sixteen hours earlier. In the placid little living-room his wife, heavy-eyed now, was sitting by the light with the three-year-old in her lap." A brief visit with the youngster, an interchange of stories of the day's doings between the doctor and his wife, and a picked-up dinner from the ice-box brings the busy day to a close.

"Back in the bedroom he stopped taking off his collar to answer a question. She had said 'Do you still want the baby to be a doctor?'

"'If he wants to. Sure. He'll be old enough to start in when I'm sixty. Nancy would make a good doctor, too. So would Henrietta. Why?'

"'Oh! Nothing.' said his wife. 'What time do you have to be out tomorrow morning?'"

A realistic story of the general practitioner of today by a doctor's wife! The family doctor is not passing. His professional resources have been greatly enhanced by the advances of modern medicine, and the aids which he can command from specialists. But he, himself, is still the dependable, sympathetic, and trusted reliance of those who are in pain and distress from ever-present illness.

### JOURNAL OF HOME ECONOMICS

"A successful cooperative play-school," described in the *Journal of Home Economics* for August, seems an ideal arrangement for mothers and young children in a small community. The object of the organization is to keep children safe and happy while their mothers are busy with housework, but the children learn as well as play. They learn to "give and take," to share their toys, to take turns, and to be obedient. A director, trained in kindergarten work and child care, is in charge of the play-school, but since a bevy of small children furnishes too much work for one person, the mothers take turns in helping; two are there to assist in the physical care of the children each morning and afternoon. The discipline is left entirely to the director, as is the supervision of all activities. The children observe a daily routine, thereby learning habits of punctuality and orderliness. The mothers meet once a week to talk over with the director the failings of their children and the best way to correct them. This nursery is a small social institution for small persons which leads them from a "that's mine" to a "you can play with it" attitude.

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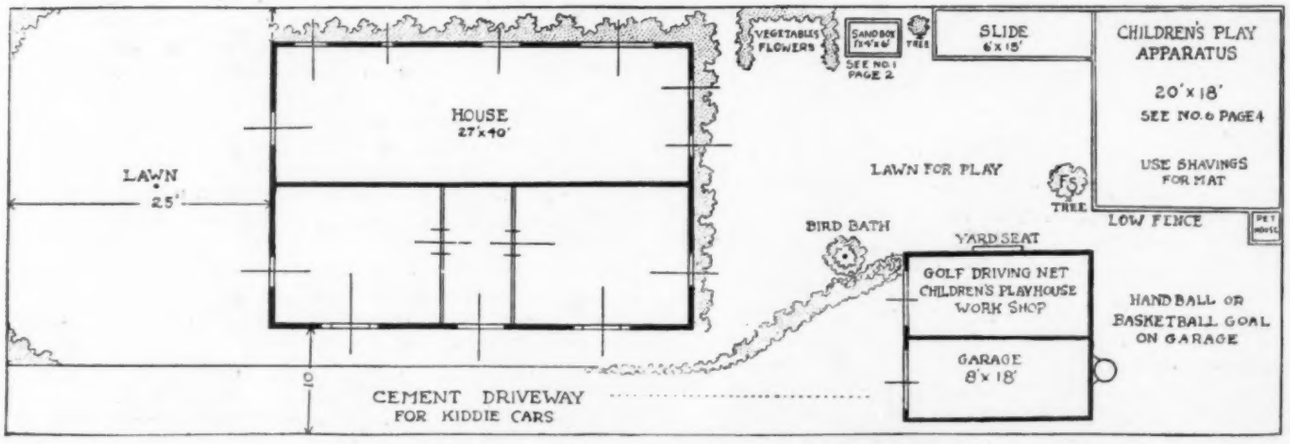
## *Back-Yard Playgrounds*



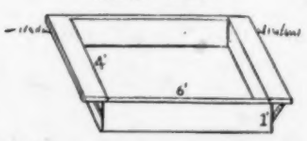

SUGGESTED LAYOUT FOR A BACK-YARD PLAYGROUND
Lot 40 x 120 feet

Everything that tempts children to spend most of the daytime hours outdoors should be encouraged because of the beneficial effect on health through the development of robust, vigorous physique. The playground parks that are now provided in our larger cities have accomplished a great deal in this direction and have kept children off the street and out of mischief.

The back yard of any home, even if it is small, can be equipped with apparatus that affords constant inducement to outdoor exercise and play to children of every age.

The *Bulletin* of the Recreation Department of Oakland, California, reprinted as Folder No. 2 of the Children's Bureau of the United States Department of Labor, gives illustrations of several forms of apparatus with suggestions of other back yard features that are practical and useful. Parts of the leaflet are here reproduced.

SAND BOX



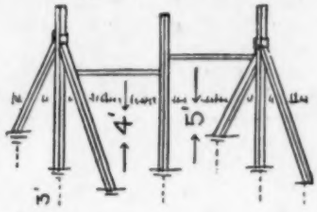

MATERIAL NEEDED:

2 pieces pine 2 inches by 12 inches by 6 feet.
2 pieces pine 2 inches by 12 inches by 4 feet.
1 load of clean white sand.

Sand may be dampened to mold. Small garden tools are useful. Note the shelf around the box.

COST—Approximately $2.00.

HORIZONTAL BARS



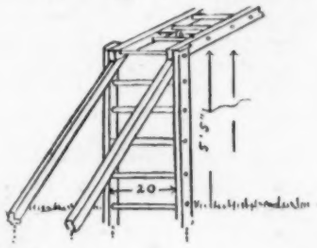

MATERIAL NEEDED:

3 pieces redwood or any hardwood 4 inches by 4 inches by 12 feet.
4 pieces redwood or any hardwood 2 inches by 4 inches by 6 feet.
2 pieces 1½-inch pipe 5 feet long.

Bore hole for bar and set with bolt.
Keep shavings under bar.

COST—Approximately $6.75.

HORIZONTAL LADDERS

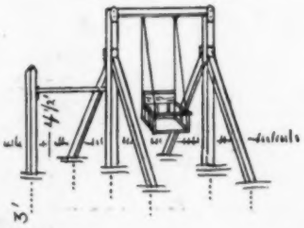



MATERIAL NEEDED:

4 pieces redwood or any hardwood 2 inches by 6 inches by 10 feet.
4 pieces redwood or any hardwood 2 inches by 4 inches by 10 feet.
1 ladder 10 feet long.
10 pieces ¾-inch pipe 25 inches long.
Bolts and nuts.

COST—Approximately $14.50.

BABY SWING




MATERIAL NEEDED:

2 pieces redwood or any hardwood 4 inches by 4 inches by 14 feet.
1 piece redwood or any hardwood 4 inches by 4 inches by 10 feet.
4 pieces redwood or any hardwood 2 inches by 4 inches by 8 feet.
1 piece pine 4 inches by 4 inches by 6 feet.
1 kindergarten swing and fastenings.
1 piece 1½-inch pipe 5 feet long.

COST—Approximately $8.55.

### Caution—Read Carefully

Inspect apparatus frequently.

Put low fence around swing. Protect children playing near the swing.

Keep 12 inches soft shavings under rings, bars, and ladder.

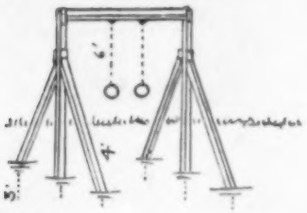
Set bolt through timber and bar to prevent the bar from turning. Set posts well in ground or in cement. Bolt all apparatus securely.

Do not buy fragile equipment.

Do not buy freak or high apparatus.

Have competent man set up frames.

FLYING RINGS

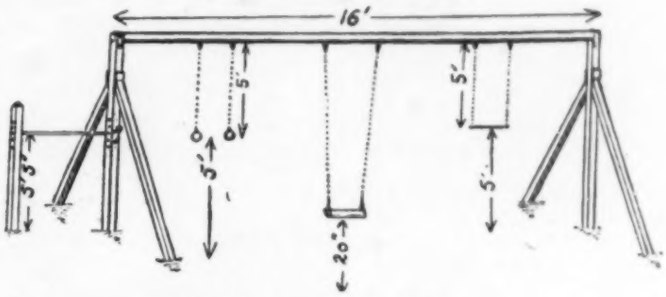



MATERIAL NEEDED:

2 pieces redwood or any hardwood 4 inches by 4 inches by 14 feet.
4 pieces redwood or any hardwood 2 inches by 4 inches by 8 feet.
1 piece pine 4 inches by 4 inches by 6 feet.
2 chains, rings, and fastenings.

COST—Approximately $10.25.

SWING AND TRAPEZE




This combination is recommended.
For small children, use the kindergarten swing and no trapeze.

MATERIAL NEEDED:

2 pieces redwood or any hardwood 6 inches by 6 inches by 14 feet.
1 piece pine 4 inches by 6 inches by 16 feet
1 piece redwood or any hardwood 4 inches by 4 inches by 10 feet.
4 pieces redwood or any hardwood 2 inches by 4 inches by 10 feet.
1 piece 1½-inch pipe 5 feet long.
1 swing, rings, trapeze, and fastenings.

COST—Approximately $21.25.

ADDITIONAL APPARATUS

Slide—cost approximately $20 to $45.
Teeters—2 inches by 10 inches by 12 feet surfaced, 14-inch base.
Play house—keep side open for supervision.
Pet house—for rabbit or dog.
Bird bath—will attract many birds. Build out of reach of cats.
Lawn, shrubs, and vegetables as suitable.
Cement driveway for coasters.
Other standard playthings:

Sand tools, engines and cars, wagons, picture books, toy furniture, tub and washboard, smooth sticks and dishes, blocks, carts, coasters, pictures, soft clay, dolls, stones, colored glass, and so forth, doll house, gas bouncing balls, paints, small garden tools, scissors, cradles and beds, brushes, jump ropes.

FOR OLDER CHILDREN

Basketball goal on garage.
Use garage for handball backstop.
Use center of yard for volley ball and tennis.
High jump pit with standards.
The garage may be used for a golf driving net by dropping a canvas.
Yard seats, rigid or swinging.

*October*

The days grow short and winter comes apace;
The golfer now has but a month of grace;
The football player soaks himself in grime,
And tries to fight his way across the line;
The summer cold gives way to wint'ry sneezes;
The coal man smiles, for ev'ry prospect pleases.

**Quite Comfortable**

*Wyocena Advance*

Mrs. Galway had left the parlor and was in bed with a novel and a kerosene lamp.

IN THE DARK AGES

When Rastus Johnson's son arrived,
He looked just like his poppy,
In fact, the doctah done declared,
He was a carbon copy. *Cornell Widow.*

When Mrs. Johnson saw the boy
And made a start to bathe him,
She said "No stork has brought this chile,
It must have been a raven."

HIS POINT OF VIEW

A friend of ours went to a dentist and asked him to take a look at his teeth. The dentist did so and seemed full of admiration.

"What do you think of them?" asked the patient.

"Magnificent! Magnificent!" was all the dentist said.

"Then you don't find anything to do to them?"

"To do to them? Why, there are four to be pulled, six to be filled and a bridge to make," said the dentist.

DIFFICULT DIAGNOSIS

The young mother was frantic. Her 2 year old daughter howled and howled and howled.

"Whatever is the matter with the child?" asked the father in despair.

His wife sank limply into a chair and began to weep, while the baby went on howling.

"I d-d-d-ont know!" sobbed the distracted mother. "It's either because she's eaten too many strawberries, or she wants more!"

*A Lullaby*

*New York Sun*

*Rock-a-bye baby, upon the bough,*
*You get your milk from a certified cow!*
*Before your eugenic young parents were wed*
*They had decided how you should be fed.*
*Hush-a-bye baby, on the tree top,*
*If grandmother trots you, you tell her to stop,*
*Shun the trot horse that your grandmother rides—*
*It will work harm to your little insides.*
*Mamma's scientific—she knows all the laws—*
*She kisses her darling through carbolized gauze.*
*Rockabye baby; don't wriggle and squirm;*
*Nothing is near you that looks like a germ.*

**Only a Bruise**

*Carey (Ohio) Times*

In attempting to get out of the way, Mrs. Stall fell, bruising her somewhat.

WATCH OUT

"A man, like a watch, is known by his works," observed the epigram maker.

"And by the hours he keeps," added the wife.

"And by the spring in him," said the athlete.

"And by his being fast sometimes," remarked the reformer.

"And by the way his hands go up," put in the pugilist.

"And by his not always going when we want him to," said the girl who'd been robbed of her sleep.

"And by the case he has and the way he is run down," said the doctor.

HIGHER MATHEMATICS

A country lad went to New York and tried to secure a job on the police force. He passed the physical tests, but the written examination gave him a little trouble. One question was: "A man buys an article for $12.25 and sells it for $9.75; does he gain or lose on the transaction?"

After pondering over the question our rural friend finally answered: "He gains on the cents, but loses on the dollars."

A BAD BREAK

"So Miss Passay is angry with her doctor. Why is that?"

"He tactlessly remarked that he would soon have her looking her old self again."

*WHO PUT 'L INTO COLDS?*

*I, said the draft, I catch 'em fore and aft.*
*I, said infection, I do it by injection.*
*I, said bad air, I catch 'em all for fair.*
*I, said wet feet, I do 'em up neat.*
*Then they all sang together*
*We are out in all weather*
*We keep 'em in, though it is sin*
*If they'd go out and walk about*
*'Twould break the spell, there'd be no 'l*
*They'd have no cold as of old.*
*But as long as they do wrong*
*We'll see there is 'l in a cold.*

*—Northwestern Health Journal.*

**Pull the String**

*Health Items Portland Argus*

A simple remedy to dislodge a fish bone or anything in the throat is to fasten a button securely to a string, swallow the button, then pull the string. No difficulty is found in this simple method, and it will always remove the obstruction with absolute certainty.

For the benefit of those readers who do not realize that this department of HYGEIA is humorous, it may be well to suggest that there exist other methods of removing fishbones.

# Protect Your Children Against Diphtheria

***Recent laboratory and clinical investigations prove that nearly all individuals can be immunized so that repeated exposures to diphtheria will not produce the disease. The protective inoculations can be given by any physician. Ask your doctor to protect your family.***

THE diphtheria toxin which is injected into horses in order to produce antitoxin protects the horses to the extent that subsequent large doses of toxin do not even make them seriously ill. But the blood serum of these horses (diphtheria antitoxin), when injected into human patients, gives protection against the disease for only a relatively short period of time.

A way has been found whereby toxin can be safely administered to human patients to produce antitoxin right in the blood of these individuals. Antitoxin so made imparts a prolonged protective immunity.

The addition of a carefully measured quantity of diphtheria antitoxin to a minute dose of the toxin deprives the toxin of its poisonous quality and does not interfere with its desirable antitoxin-producing property.

The name of this combination of toxin and antitoxin is toxin-antitoxin mixture or Diphtheria Prophylactic.

The utmost precision is required to achieve the delicate adjustment between the toxin and antitoxin. Too much toxin makes the mixture poisonous; too much antitoxin makes it valueless.

Our equipment, our skill, and our serious sense of responsibility are warrant for the quality of Diphtheria Prophylactic—the toxin-antitoxin mixture manufactured in our laboratories.

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ASK YOUR DOCTOR TO PROTECT YOUR FAMILY

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**The Original Malted Milk**

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especially for growing children and those who are subject to nervous, anaemic and digestive disorders.

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*Literature on its home uses and advantages, together with sample, prepaid on request*

**HORLICK'S**

**Racine, Wis.**


## OH! VERY WELL!

*(Continued from page 472)*

THE SHORTEST COUNT

A tourist in Arizona heard a shot and in a short time came upon a rough looking citizen busy cutting a notch on the handle of his gun.

"Have you killed a man?" he gasped.

"Nope."

"Then why the notch?" asked the Easterner.

"I only cut 'em when I misses," said the bad man.—*S. B. A. News.*

FOR A LONG VISIT

Little Madge was in high excitement; a baby brother had arrived on the scene. She spread the good news, and among others told the gardener, a bit of wag. "The question is," said the old man, "is the new baby going to stay?" "Oh, yes, he means to stay," said Madge, "he's got his things off."—*London Morning Post.*

THE EXPOSURE

Doctor—How did your husband take pneumonia?

Dovey Dawson—Doctah, he bought hisself a diamond shirt stud!—*Life.*

CHIROPRACTICALLY SPEAKING

Two colored gentlemen were arguing.

"You ain't got no sense," said one.

"No sense? Den what's dis head of mine for?"

"Head? Dat's no head, niggah. Dat's jes' a button on top of yo' body to keep yo' backbone from unravellin'."—*Pickup.*

FROM THE DOCTOR'S RECORDS

*Doctor.*—Of what did your father die?

*Patient.*—They said calvary mortis.

*Doctor.*—And your mother?

*Patient.*—Oh! nuthin' serious.

*Doctor.*—Well. What did the doctor call it?

*Patient.*—He said it was brides disease, but she was an old woman and a widder. F. J. V.

HOW SUSIE PASSED

Pretty Susie Smith had been studying medicine, and although she didn't make much actual progress at the work, she managed to get along very well with the lecturers, for she had what is called "a way with her."

Whenever she was asked a question she could not answer she would smile in a most appealing way. When the examinations came along she was equally successful.

"Now, Miss Smith," said the examiner, "tell me how you would treat a case of typhoid?"

"Well, sir," was the hesitating reply, "—I should er—"

"Yes, yes!" said the professor impatiently. "Go on."

"I—I—" Then with a rush: "I should call you in for consultation."

She passed with honors.—*Pickup.*

KEEPING IT QUIET

An Irish laborer had been warned to be careful of a quarry pit in the neighborhood. His foreman saw him suddenly stagger and disappear over the crest of the opening.

At once he ran to the edge. "Are you dead, Padraic?"

"Sure, an' I'm kilt entirely."

"Man, you don't sound dead."

"Well, if I'm not dead, I'm knocked spacheless."

*(Continued on adv. page 12)*


# HYGEIA

## REPRESENTATIVES WANTED IN EVERY COMMUNITY

*Goddess of Health* *Journal of Health*

Men and women are needed in every community to represent HYGEIA, the new national health magazine. HYGEIA is providing reliable health education for the home, the school and for industry. It is a veritable year round health service. Someone is needed in every community to secure subscriptions for this new health Journal. The work is pleasant, dignified and profitable. You can devote your entire time or arrange to work on a part time basis. Splendid opportunity to earn extra money and add to your regular income. Get our subscription offer. You incur no obligation. Use the coupon below.

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